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Review Committee



CANADA

Le Comité d'examen de la Loi  
sur la sécurité ferroviaire



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# ON TRACK

THE FUTURE OF RAILWAY SAFETY IN CANADA

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# ON TRACK

THE FUTURE OF RAILWAY SAFETY IN CANADA



REPORT OF THE RAILWAY SAFETY ACT REVIEW COMMITTEE  
1994



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The Railway Safety Act  
Review Committee



Le Comité d'examen de la Loi  
sur la sécurité ferroviaire

TO THE HONOURABLE  
MINISTER OF TRANSPORT

Dear Minister:

We, the Members of the Committee, have the honour to submit to you,  
pursuant to Section 51 of the *Railway Safety Act, 1988*, the report of the  
Railway Safety Act Review Committee.

Respectfully submitted,

Maurice C. Engels  
Chairman

Armand E. Goguen  
Member

Wayne M. Ochulenko  
Member

December 1994



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## PREFACE

*A train is a camera  
continuously rolling with  
irretrievable footage.\**



The railway is central to the romantic side of the Canadian identity. To this day, Canadians continue to be intrigued by railways built more than a century ago. They were the original means by which Canadians communicated with and learned about each other. Year after year, young people from the East set out by rail for jobs in the Rockies and families journeyed across Canada on vacation to see the country. To so many Canadians, the railway has represented both adventure and necessity.

Rail is much more than a romantic travel mode; it remains today a vital part of the economic engine of this country. Railways are integral to the movement of natural resources and manufactured products from across the country to markets and ports in other parts of Canada and abroad.

Rail transportation continues to be one of the safest modes of travel worldwide, yet many Canadian communities are concerned about its safety. Rail disasters such as those at Hinton and Mississauga have focused public attention on rail safety issues. As the nation's rail corridors mature, Canadians look to governments — municipal, provincial and federal — as well as to the carriers themselves to ensure that the Canadian railway system is efficient, economic and, above all, safe.

Travelling across Canada, we learned firsthand about Canadians' safety concerns. We talked to business leaders, consumers, the railway industry, academics and representatives from all levels of government. We heard from parents of children killed in grade crossing accidents, from workers concerned about occupational issues, from environmentalists anxious about the implications of chemical spills and from the railways themselves, struggling in times of economic recession and yet meeting their safety standards.

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\* B.D. Johnson, *Railway Country: Across Canada by Train* (Toronto: Key Porter Books, 1985), p. 11.



We were moved by the passion of Canadians as they expressed their concerns and fears, but were equally impressed with the creativity and commitment of all parties as they endeavour to find solutions to both age-old problems and new challenges as Canada completes the transition from the industrial to the information age and beyond.

We wish to thank Peter Brennae, our Executive Director, and Gordon Chapman, our Director General of Consultations and Research. We could not possibly have produced this report without their energy and commitment. We also thank the Committee staff, who have worked tirelessly to organize meetings across the country, record and interpret findings, research rail safety issues and assist in producing this report. In addition, our thanks go to our external researchers and consultants.

This report presents our conclusions and recommendations. It is our hope that this review raises important issues that can be managed and resolved and that it will result in improved safety for passengers, workers and communities, now and in the future.

## EXECUTIVE SUMMARY



The Committee's mandate in this report was to review the *Railway Safety Act* (*RS Act*). We did so in the context of the events that led to the *RS Act*'s creation, its current impacts and its appropriateness for the future. We examined the present system and have made recommendations that we believe will serve to promote the highest level of railway safety in the most effective and efficient manner possible.

These changes will allow the industry to prosper in the future by being responsive, competitive and, most importantly, safe.

The *RS Act*, which came into effect in January 1989, was intended to "ensure the safe operation of railways," and its efforts were focused on:

- engineering standards and grants for railway works that contribute to safe railway operations;
- regulation and rule-making powers regarding the operation and maintenance of railway works and equipment;
- non-railway operations affecting railway safety;
- the Minister's power to appoint railway safety inspectors (RSIs), and to issue orders and emergency directives;
- the Minister's power to establish a Railway Safety Consultative Committee;
- regulations incorporating by reference any classification, standard or procedure, and their publication; and
- necessary changes to other statutes to make them consistent with the *RS Act*.

To ensure that the implementation of the *RS Act* met all parties' expectations, a provision was made for a review of its impact on railway safety after five years.

During our review, we found that railways in Canada are safe in comparison with competing modes of transportation and railways in other nations. We note, however, that there are safety areas in which

situations beyond the railways' control can have tragic consequences, such as drivers of motor vehicles who take insufficient precautions at grade crossings and risk collisions with trains. We were frustrated by the lack of knowledge of the causes of and remedies for these problems and believe firmly that we must investigate and develop workable solutions.

After reviewing the state of rail safety, we came to the conclusion that the system must be changed to one that is both non-prescriptive and industry-driven. To that end, we report our findings and advocate improvements to the overall safety framework, but leave the details to the appropriate authorities. We encourage maximum flexibility for the railways, the regulator and other levels of government to implement the recommended changes. This is in keeping with the spirit of the *RS Act* itself, which was based on a desire to provide the railway companies with greater freedom to manage their operations safely and efficiently.

Ideally, we envision the regulator as serving more as an auditor, adhering to the strictest standards of quality assurance and leaving the railways themselves to propose and manage how they will ensure optimum rail safety. We give considerable attention to modernizing the safety framework by eliminating out-of-date regulations, improving the consultation mechanism and developing a new and responsive process. We recommend that railway-developed safety programs be established as rules under the Act, thus creating a "contract" between the regulator and the regulated.

The regulator continues to play the lead role in ensuring public safety. The railway companies have always placed great emphasis on railway safety and have provided an impressive set of standards and procedures to ensure that their operations are among the safest in the world. One of the Committee's concerns, however, lies in the areas of interface between railways and the public, where the railways have less control and where the dangers have been demonstrated to be of greater consequence. This is illustrated in such examples as grade crossings and anti-whistling rules, for which responsibility is in some instances unclear and may lie partly with the provinces or municipalities. We recommend a number of cooperative initiatives in such instances, to ensure greater safety to the public in areas where there is interface with railway operations. The Committee proposes that the federal government show leadership by clarifying roles for governments, railways and road authorities in this critical area. We see a need for greater focus on education in the context of road-rail intersect issues. We urge all parties involved to



strive together to develop and implement a comprehensive plan to reduce by 50% within 10 years the accident rate at Canadian grade crossings.

Our review considers a variety of issues affecting or affected by railways: the environment; the use of intoxicating or mood-altering substances by those in safety-sensitive positions; the roles of the railway companies and their industry associations in ensuring safety; and the emerging number of short line railways as more and more rationalization of Canada's rail infrastructure takes place.

The Committee also notes with some alarm the proliferation of acts of vandalism on railway property, and the threat they pose to safety. The recent act of sabotage at Brighton, Ontario, resulting in injury to more than 40 passengers and several million dollars' worth of damage to a VIA Rail passenger train, illustrates vividly the need to eliminate these senseless acts.

We have devoted a chapter to a recently burgeoning side of the industry — smaller, provincially regulated railways. This sector is growing as the larger, federally regulated railways consolidate their operations. Our concern is that safety regulation must evolve to mirror the nature of the industry itself, which is continentally interconnected. The current regulatory system varies from province to province. The federal regulator, in performing inspections in some provinces, must adapt to take into account the specific attributes of all classes of railway. A consistent and national scheme is clearly needed both to ensure safety and to provide a framework in which this segment of the industry may flourish.

Our various analyses and recommendations are examined collectively in Chapter 11, where we propose a new and comprehensive framework for regulating railway safety in Canada. Within that framework, the regulator is urged to seize the mantle of leadership in areas such as crossing safety by combining the numerous factors involved into a coherent policy thrust acceptable to and feasible for all parties involved.

A more efficient model will require the Railway Safety Directorate (RSD) to first restructure its decision-making apparatus for the setting of priorities to link them to established performance objectives and to ensure it has the appropriate skills to undertake its new mandate. We also comment on the need for a more coordinated effort to collect and disseminate safety data in this country.

Many of the proposals brought to the Committee are reflected in the main body of the report or in Appendix 1, which deals with other issues. Although the report reflects many views, the conclusions are those of the Committee. The Canadians who put forward their views, whether railway officials, government authorities, unions or interested citizens, all contributed to the ideas that form the basis for this report.

Our report assesses the impacts of the *RS Act* by studying its evolution and current implementation. More importantly, it looks towards the future. A century ago, railway safety meant ensuring that a train crossing the Prairies at 50 kilometres per hour (kph) did so according to specified standards and within prescribed operating limits. More recently, VIA Rail trains have sped between urban centres at 160 kph, the maximum rail speed allowed in Canada. The future promises to open up even newer dimensions. France, for example, is planning for a 600 kph train before the year 2000.

The Committee recognizes the huge impact of such technological advances in train speeds, design and track construction on the nature of railway regulation and the manner in which safety can be achieved. We believe that our recommendations will allow the railway industry to take advantage of a changing future by providing it with a flexible framework within which to operate. We are confident that the implementation of our recommendations will help to ensure that the *RS Act* and related statutes provide a strong foundation for effective railway operation now and in the future.

# INTRODUCTION

*It is clear that the railways  
are a very special part of  
Canadian history.*



## THE NEED FOR A REVIEW

---

On December 31, 1993, the Railway Safety Act Review Committee was established by the Honourable Douglas Young, Minister of Transport, to review the operation of the *Railway Safety Act (RS Act)*.

At the time the legislation was passed, the government believed it prudent to ensure that certain checks and balances remained in the system. One of those checks was a review, after five years, of the impact of the Act.

In general, the Committee was asked to consider the impact of the Act on the safety of: the construction or alteration of railway works; the operation and maintenance of railway works and equipment; non-railway operations affecting railway safety; and the administration and enforcement of rail regulation.

## A SPECIAL CONTEXT

---

Over the past year, the Committee heard presentations and reviewed briefs from railway companies, unions, interest groups and private citizens. During the course of these hearings, it struck the Committee that the review was taking place in a very special context. The task was more than a simple look at a piece of legislation and its strengths and weaknesses over a five-year period. It had to take into account the culture, the sentiment and the history that are all part of Canada's rail legacy. More importantly, it had to examine safety concerns in the context of a future that will be guided by rapid technological change.

The challenge for the Committee was to weigh rail safety concerns in light of the past, present and future and to provide a balanced and realistic framework in which to consider changes to the legislation.

## THE PAST

---

It is clear that the railways are a very special part of Canadian history. Even before Confederation, Canadians dreamed of having a transcontinental railway linking Canada from sea to sea, but the reality proved much more difficult than anticipated. The building of an efficient transportation system was hampered by topography, climate and vast distances. Adding to the problems of geography was the problem of linking a small, widely dispersed population. These challenges were some of the many significant decisions facing Canada's Fathers of Confederation.

For much of the first part of this century, Canadians set about making their "national dream" come true, building railway tracks across the country. The result was a truly Canadian rail system, which rail historian Donald MacKay describes in *The People's Railway* as a railway "born of the turmoil of World War I and a marriage, unique among railways of the time, between private and public enterprise. The CNR (later CN) was one of Canada's first crown corporations, a commercial business and an instrument of government all in one . . ." <sup>1</sup>

The rail debate was all-consuming for politicians at the turn of the century and, even today, remains a national concern. The rail system certainly formed an integral part of Canada's national identity and, as MacKay writes, " . . . it is not always clear which came first, the nation or the railway, for while Confederation depended on railways, the railways needed Confederation to assure their viability." <sup>2</sup>

In addition to its impact on the country's politics and history, the rail system has played an important role in industry, linking together and opening up new markets while creating a demand for fuel, iron and steel, as well as engineering services.

This accomplishment was not without a price. Countless workers perished building the railways. Operational safety in the immature industry was not ingrained as it is now. Many accidents occurred due to unsafe practices, and the industry learned from these experiences.

In the second part of this century, as MacKay notes, the railways "with their massive infrastructure of rail, rolling stock, stations, round-houses, coal depots and freight sheds . . . were Canada's most visible industry." <sup>3</sup>

## THE PRESENT

---

The rail legacy continues today. Canadian National Railway Company (CN) is one of the largest systems in the world. Together, CN and Canadian Pacific Limited (CP) account for more than 90% of all railway freight revenues in Canada.<sup>4</sup> In addition, there are many other participants in the industry running railways that vary from large provincial operations to small shunting yards.

Growing competition from south of the border and from other modes of transport, particularly the trucking industry, has presented serious challenges for Canadian railways. However, the industry has managed to meet many of these challenges, rebounding to become a more competitive and vital part of Canada's transportation system while maintaining a high level of safety.

However, as the National Transportation Act Review Commission noted, the rail system continues to be plagued by inefficiencies that threaten its long-term viability: "Even an optimistic observer would acknowledge that Canada's railways cannot make a contribution to increasing national economic competitiveness unless major changes are made to their structures and costs."<sup>5</sup>

According to the Commission, "Plant rationalization could considerably reduce the operating expenses of Canadian railways. According to CN, for example, just one-third of the company's track handles 90% of its tonnage . . . The size of that physical plant must be changed if Canadian rail carriers are to effectively compete with our continental neighbours."<sup>6</sup> The Committee's concern is that safety issues retain their importance despite the changes in the industry.

## THE FUTURE

---

The prospects of high-speed rail in Canada will be an important issue for the future, in terms of both sheer economics and the viability of the railways and transportation sector. In Europe, the emergence of high-speed rail has created a virtual renaissance for the rail industry. Even in the United States, Amtrak is pondering which sort of high-speed train will be chosen to run the high-density northeast corridor between Boston, New York and Washington. In the Far East, huge investments are being poured into railways. By the year 2000, China alone will have spent almost U.S.\$50 billion on railways.



High-speed rail has important implications particularly for urban travellers who regularly ride the train between Quebec, Montreal, Ottawa, Toronto and Windsor. It raises exciting possibilities for the future, as Canadian business and leisure travellers look forward to riding a high-speed train from urban centre to urban centre. But safety concerns will have to be addressed. As well, the issue of high-speed rail may force Canadians to revisit the debate conducted by their forefathers concerning substantial investment in a new (revamped) rail structure to take Canada safely into the future.

It is important that any consideration of the future of Canada's rail system address safety issues. Public safety in today's context means much more than protection of life and limb; it also includes protection from adverse environmental consequences. It is clear that Canadians want to safeguard the country's air, water and land from contamination. It is also apparent that Canadians are willing to contribute financially to ensure that protection.

## THE COMMITTEE'S MANDATE

---

It was within the economic, social and environmental context of the 1990s that the Railway Safety Act Review Committee was established. The Committee's legislated mandate is set out in Section 51 of the *RS Act* and in essence is:

- to carry out a comprehensive review of the operation of the Act, including an evaluation of its impact on the safety of railway operations; and
- to report, no later than December 31, 1994, to the Minister of Transport its findings, evaluations and any recommendations for amendments to the Act that it considers appropriate.

In its review, the Committee gave full consideration to the work already carried out on the effect of the *RS Act* by Transport Canada and by the review commissions of the *National Transportation Act, 1987* and the *Canadian Transportation Accident Investigation and Safety Board Act*. The Committee used this information to avoid duplication of effort and to form the basis for consultations with interested and involved parties.

What the Committee found, through its consultations, was a nation facing formidable challenges in the transportation sector and looking towards the future. The Committee believes that Canadians have the collective will, commitment and ingenuity to meet and tackle these challenges, and that its work will prove useful in addressing issues related to the future of rail safety in Canada.

## NOTES

1. D. MacKay, *The People's Railway: A History of Canadian National* (Vancouver: Douglas & McIntyre, 1992), p. 1.
2. *Ibid.*, p. 2.
3. *Ibid.*, p. 7.
4. *Canada Year Book, 1992* (Ottawa: Minister of Industry, Science and Technology, 1991), p. 287.
5. National Transportation Act Review Commission, *Competition in Transportation: Policy and Legislation in Review*. Vol. I (Ottawa: Minister of Supply and Services Canada, 1993), p. 88.
6. *Ibid.*, p. 90.



## THE EVOLUTION OF REGULATION

*Rail transportation continues  
to be one of the safest modes  
of travel worldwide.*

In the pre-Confederation period, rail safety legislation was derived from existing British legislation. Then, as colonies formed and created their own legislatures, they took over responsibility for rail legislation, including the provisions relating to safety. During this era, provincial legislation concentrated on rail construction and the corporate control of railways.

### 1867–1979

During the latter part of the nineteenth century, railway construction was seen as an important way of building and developing the fledgling nation. Consequently, immense projects such as the construction of the Intercolonial Railway and the Canadian Pacific Railway (CPR)<sup>1</sup> were undertaken in an atmosphere of urgency. In today's terms, these activities would easily qualify as mega-projects, in terms of both their scope and their costs. The safety legislation governing the railways concentrated on construction and engineering issues.

The Board of Railway Commissioners was created to make the railways comply with legislation. Railways connecting two or more provinces or crossing the border into the United States were federal government responsibilities; those operating entirely within a province were provincial responsibilities, unless the federal government declared them to be “a work for the general advantage of Canada,” in which case the federal Parliament could appropriate jurisdiction.<sup>2</sup> This division of responsibility continues today and, as will be discussed, has created some difficulties.

- |      |  |
|------|--|
| 1867 | The <i>Constitution Act, 1867</i> (formerly the <i>British North America Act</i> ) cites the Intercolonial Railway as part of Canada's Constitution. |
| 1868 | The <i>Railway Act</i> creates the Railway Committee.  |
| 1903 | The ( <i>Canadian</i> ) <i>Railway Act</i> creates the Board of Railway Commissioners.   |



---

Although the *Railway Act* was amended on several occasions during this period,<sup>3</sup> its major elements remained relatively unchanged. In 1967, the Board of Transport Commissioners (formerly the Board of Railway Commissioners) was replaced by the Canadian Transport Commission (CTC). When the *National Transportation Act, 1987* replaced the CTC with the National Transportation Agency (NTA), rail safety matters came under the purview of the new Agency. Finally, the *Railway Safety Act (RS Act)* transferred responsibility for rail safety matters to Transport Canada.

## 1980–1988

---

To understand the *RS Act*, it is instructive to examine the period 1980–1988, since the Act's development was very much tied to the events and ideas of the day. Economic regulation was changing, and the structure of safety regulation had to change with it. It was during this period that the pace of change began to quicken and that rail safety matters were brought to the attention of the railways and government.

Of particular relevance to Canada were regulatory changes affecting the operations of U.S. railroads. The *Staggers Rail Act of 1980* substantially deregulated the U.S. railroads. Canadian railways were affected by the changes insofar as they exchanged traffic and competed with American carriers. The deregulation also affected Canadian businesses shipping goods between the two countries. In recognition of the importance to Canada of the regulatory changes in the United States, the Minister of Transport ordered the CTC to undertake an "Inquiry into Effects in Canada of U.S. Rail Deregulation."<sup>4</sup> In its report to the Minister, the CTC Inquiry concluded that the regulatory changes had created a need to harmonize the Canadian and U.S. systems, and that it would



be in Canada's best interests to adapt to the U.S. model in order to make Canadian industry more competitive in U.S. markets. The Inquiry also concluded that the viability of Canadian railways required a solution that would protect their revenue share on transborder traffic, but that would not create a disadvantage for Canadian industry. The Inquiry recommended further study of the situation before significant changes were made. However, by this time events were starting to overtake the deliberate and studied

*The Committee believes that the underlying principles of the RS Act remain valid, and these principles formed key benchmarks for its analysis of the Act, as it examined the extent to which the results lived up to the original intentions.*

approach recommended by the CTC Inquiry.

In July 1985, the Minister of Transport released a White Paper entitled *Freedom to Move: A Framework for Transportation Reform*, which asserted that the Canadian transportation system was mature and no longer in need of protection and nurturing. The paper argued that the time had come to allow federally regulated transportation operators to compete both intra- and inter-modally. Competition and innovation were seen as the stimuli for a revitalized transportation sector. The White Paper emphasized the importance of safety, and the Minister, in introducing *Freedom to Move*, stated:

I would like to indicate unequivocally that the Government will neither propose nor permit any economic regulatory reform that might be detrimental to safety standards.<sup>5</sup>

In the 1980s, deregulation (or economic regulatory reform) became the philosophy underlying the policy approaches of most Western democracies, including Canada. The proximity of the United States, Canada's major trade partner, and its huge markets made it a key example of deregulation in many sectors, including transportation. Canada followed the example of others and separated the institutional responsibilities for economic regulation, accident investigation and safety regulation.

This resulted in the presentation to Parliament of a series of enabling Acts, including:

- the *National Transportation Act*, 1987
- the *Motor Vehicle Transport Act*, 1987
- the *Shipping Conferences Exemption Act*, 1987

- the *Railway Safety Act* (1988)
- the *Canadian Transportation Accident Investigation and Safety Board Act* (1989)
- the *Coasting Trade Act* (1992).

## OVERVIEW OF THE *RAILWAY SAFETY ACT*

1980	United States deregulates rail transportation.
1985	<i>Freedom to Move</i> (White Paper) released.
1988	First reading in House of Commons for the <i>Railway Safety Act</i> [Bill C-105].
1989	<i>Railway Safety Act</i> comes into effect.

The *RS Act* received its first reading in the House of Commons on February 4, 1988 and came into effect on January 1, 1989. It was designed to make federal handling of the rail mode consistent with that of the other federally regulated modes of transportation. Transport Canada would have responsibility for rail safety matters, the Canadian Transportation Accident Investigation and Safety Board (TSBC) for accident investigation and the NTAgency for economic regulation.

The major elements of the new legislation, as described by the government of the day, can be summarized as follows:

- Rail safety was placed directly under the Minister of Transport.
- The Minister of Transport was given the ability to respond quickly to any safety concern and to hold the railways accountable for their operations.
- The approval process for adjusting regulations was streamlined.
- The approval process relating to new construction, operating rules and grants was also streamlined.
- Parts of the *Railway Relocation and Crossing Act* were repealed and funding provisions were incorporated in Section 12 of the *RS Act*.

In summary, the *RS Act* was designed to:

- separate safety regulation from economic regulation and from accident investigation, with responsibility for safety going to the Minister of Transport;
- provide modern legislation with a streamlined regulation development and approval process;
- harmonize the Canadian rail regulatory regime with that of the United States;
- provide railway companies with greater freedom to manage their operations efficiently and safely; and
- advance rail safety in Canada.

The Committee believes that the underlying principles of the *RS Act* remain valid, and these principles formed key benchmarks for its analysis of the Act, as it examined the extent to which the results lived up to the original intentions.

## NOTES

1. The Intercolonial Railway, completed in 1878, linked the Maritimes to Lower Canada, and CPR's first transcontinental railway, from Montreal to the Pacific coast, became operational in 1885.
2. Cited in R. Dorman and D.E. Stoltz, *A Statutory History of Railways in Canada, 1836–1986* (Kingston: The Canadian Institute of Guided Ground Transport, Queen's University, 1987), p. viii.
3. Amendments to the Act are detailed in the *Concordance of The Railway Act*, compiled by the legal staff of the Board of Transport Commissioners for Canada (Toronto: Canada Law Book Company, 1954).
4. "Inquiry into Effects in Canada of U.S. Rail Deregulation" (Ottawa: Minister of Supply and Services Canada, 1984).
5. *Freedom to Move*, p. 2.

## ASPECTS OF RAIL SAFETY

*We can say with assurance  
that railways are safe.*

### INTRODUCTION

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As a basis for its examination of the impact of the *Railway Safety Act* (*RS Act*) on railway safety, the Committee thought it necessary to look statistically at the safety of federally regulated railways prior to and since the *RS Act* came into effect in 1989. The Committee found it useful to examine Canada's rail safety record, as well as those of other nations. In addition, it examined the safety record of trucking, rail's direct surface competitor.

The Committee noted that safety data are comprised of many differing indicators, and a variety of measurements can be done. Crossing and trespassing accidents, main track accidents, yard accidents, fatalities and injuries are just a few of the more important factors to be considered in measuring safety.

In examining the aspects of railway safety, the Committee decided to separate what it viewed as "pure" railway operational accidents, such as main track and yard occurrences, from accidents in which the general public may have played a causal role (such as crossing and trespassing incidents). As will be demonstrated, crossing and trespassing accidents remain a cause for concern, necessitating examination in a subsequent chapter.

### THE SAFETY OF RAIL OPERATIONS

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#### Main Track Derailments/Collisions, Yard and Maintenance Accidents

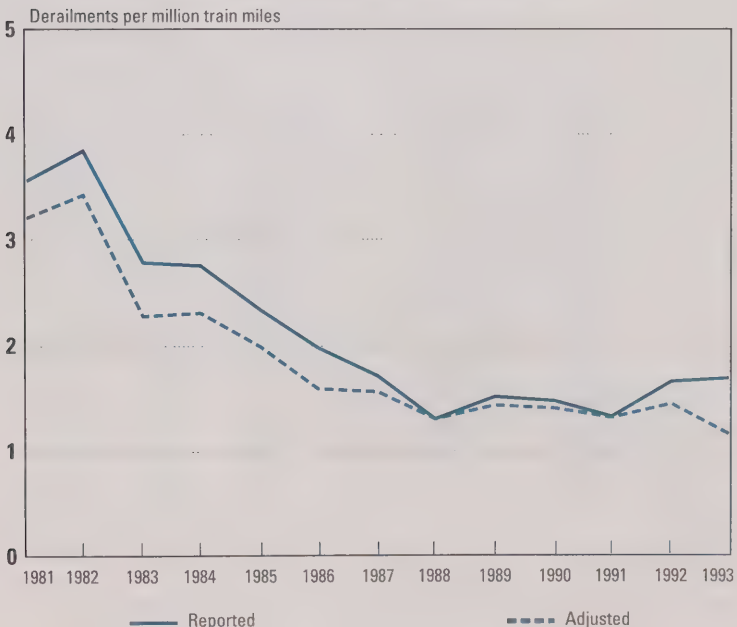
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By all accounts, the state of safety of rail operations has remained relatively constant since 1989, after a prolonged decline in accidents from 1980 to 1988. This plateau in operations safety is best exemplified by examining

a key unit of measurement, the main track derailment rate over the past decade. Expressed in terms of million train miles<sup>1</sup> and adjusted for changed reporting requirements,<sup>2</sup> main track derailments have been very low since the Act's inception, with 1993 showing the lowest rate in the 12-year period studied (see Figure 2.1). Similarly, main track collisions, also a serious type of accident, have been at an all-time low, with only six occurring in 1993 (see Figure 2.2).

As Figure 2.2 demonstrates, the accident rate in yards, sidings and spurs has shown an increase over the last decade. The increase may be partly attributable to what the Transportation Safety Board of Canada (TSBC) calls "a more conscientious reporting of dangerous goods related occurrences and the reclassification of certain products, such as molten sulphur, as a dangerous good."<sup>3</sup> The increase in yard accidents, however, must necessarily be considered in context. These types of accidents, unlike main track derailments and collisions, normally occur at slow speeds

**Figure 2.1**  
**MAIN TRACK DERAILMENT TRENDS**



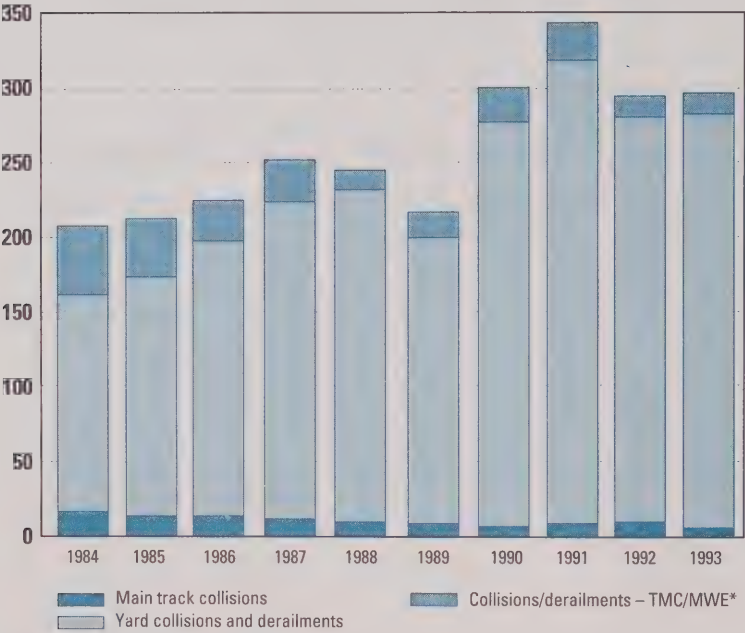
Source: TSBC, "A Special Study of Main Track Derailments," Report No. SR9401 (Ottawa: Minister of Supply and Services Canada, 1994), p. 8.



during switching operations, and the vast majority are simply reported as deviations from prescribed operational procedures.<sup>4</sup> Collisions or derailments involving track motor cars (TMCs) and maintenance-of-way equipment (MWE) (shown in Figure 2.2) declined, like main track derailments, prior to 1989 and have levelled off since.

An overall consideration of derailments and collisions on main tracks and in yards and those involving TMCs or MWE would appear to confirm that the safety of operations has remained relatively constant since 1989.

**Figure 2.2**  
**RAILWAY ACCIDENTS, 1984–1993**



\* TMC: Track motor car MWE: Maintenance-of-way equipment

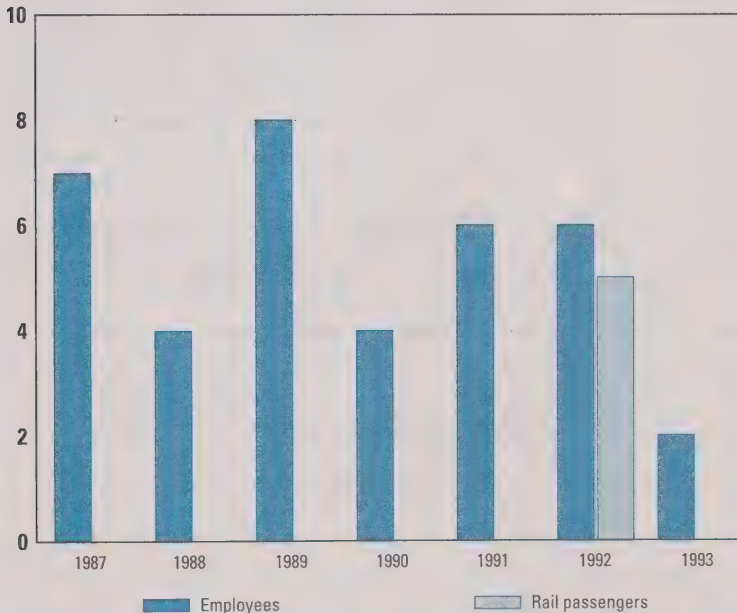
*Note:* Requirements for reportable accidents were changed in mid-1992. Figures for yard collisions and derailments for 1992 and 1993 have been reduced from those published by the Board to make them compatible with earlier years.

*Source:* TSBC, *Annual Report, 1993* (Ottawa: Minister of Supply and Services Canada, 1994), Table D, p. 46.

## Fatalities and Injuries

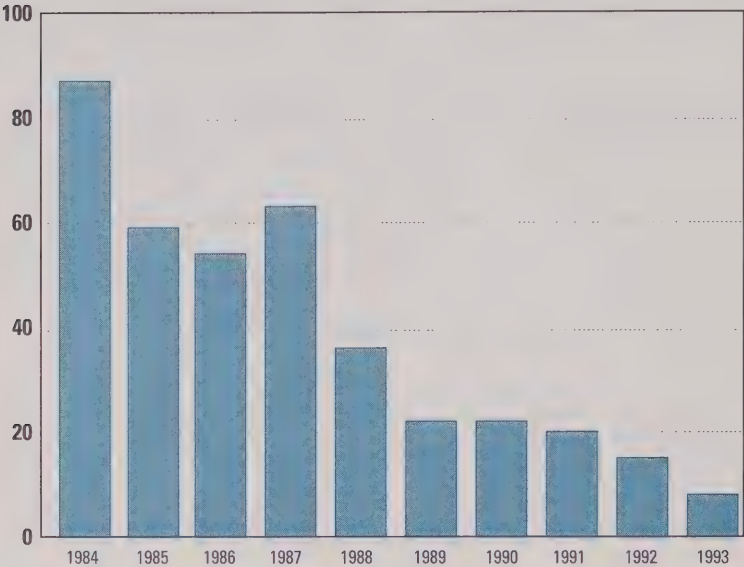
As will be shown in a separate chapter, railway fatalities are almost entirely attributable to crossing and trespassing accidents. In fact, fatalities from accidents not related to crossings and trespassing represented only 5% of all railway-related deaths in the years 1987–1993.<sup>5</sup> As Figure 2.3 shows, the number of fatalities for railway employees since 1987 has been small: from a high of 8 in 1989 to a low of 2 in 1993. Since the Hinton accident in 1986, passenger fatalities (also shown in Figure 2.3) have averaged less than one a year. The work-related safety of railways and the manner in which their operations are carried out have clearly shown improvement. Figure 2.4 indicates that the number of accidents involving employees and passengers has dropped steadily in the last decade: from a high of 87 in 1984 to a low of 8 in 1993.

**Figure 2.3**  
**EMPLOYEE/PASSENGER RAIL FATALITIES, 1987–1993**



Sources: 1987–1992: IBI Group, "The State of Railway Safety in Canada," Report prepared for the Railway Safety Act Review Committee, September 1994, p. 13.  
1993: Preliminary data from the TSBC.

**Figure 2.4**  
**RAIL ACCIDENTS INVOLVING EMPLOYEES/PASSENGERS,**  
**1984–1993**



*Source:* TSBC, *Annual Report, 1993* (Ottawa: Minister of Supply and Services Canada, 1994), p. 46.

In the TSBC's study of main track derailments, it was noted that no passenger or member of the public has been killed as the result of a main track derailment since 1983, and only two employee fatalities due to a main track derailment have occurred since 1984. The fatal accident occurred in Nakina, Ontario, in 1992, when a beaver dam collapsed, causing a critical track bed failure. The railway's routine inspection practices could not have uncovered such a problem; it could have been detected only through geotechnical analysis.<sup>6</sup>

### Conclusions on the State of Safety of Rail Operations

By all accounts, railway safety improved between 1980 and 1988, and has remained constant since 1989, the year the Act came into force. It would seem, however, that, while the Act introduced a more progressive safety regime, it has basically had a neutral effect on the safety of railways.

Neither the Committee's research nor consultations could reveal any causal link between the introduction of the Act and the plateau in operations safety that occurred after 1989. This view is shared by the railways, the Canadian Transportation Accident Investigation and Safety Board (TSBC) and the regulator.<sup>7</sup>

Numerous factors have probably contributed to the decline in accident levels since 1980. Many of these factors — raised by the Grange Commission of 1981 — may relate to new technologies and work practices that the railways employed in efforts to reduce accidents. The 1980s saw a host of initiatives designed to lessen the chances of accidents, such as the improved installation of rail and better welding techniques, the widespread use of automatic rail defect detection devices and track geometry cars, the replacement of friction bearings with roller bearings, the gradual elimination of straight plate wheels, and the use of hot box detectors (HBDs). All these factors had a beneficial effect on accident levels. Indeed, the U.S. pattern of decline in the number of accidents during this period closely resembled that of Canada, giving credence to the notion that the improved technology and operational processes being used generally by North American railways led to fewer accidents.

Why has there been a plateau in the number of accidents since 1989? The Committee's research cannot point to any definitive finding. However, many of the initiatives of the early and mid-1980s had effectively run their course by the end of the decade. For example, the replacement of friction bearings with roller bearings was almost completed by the late 1980s. Similarly, the benefits of HBDs and new methods of rail installation that may have been immediately manifested in the form of a decreased-accident trend were likely exhausted by the time the Act came into effect.

Despite the plateau in safety since 1989, we can say with assurance that railways are safe. This does not mean that major accidents do not occur. The lessons of Mississauga (1979), Hinton (1986) and Oakville (1992) are that rail accidents can be tragic and very dangerous to life and property. Nonetheless, such episodes must be viewed in context. The fact remains that the likelihood of a fatality or injury as the result of non-crossing or non-trespassing accidents is extremely low. This indicates that the actual operations of railways constitute relatively little danger to employees, passengers and the public. As will be seen, the major safety problems occur in places where the railways intersect with road transport at crossings and where the public trespasses on railway property.

## THE SAFETY OF RAIL OPERATIONS IN OTHER COUNTRIES

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Any nation concerned about the state of its rail safety will no doubt seek to measure itself against other nations for comparison. The Committee therefore undertook an examination of the state of safety in other nations, such as the United States, the United Kingdom, Germany, France and several states in Australia.

The Committee found considerable diversity in the way in which railways are managed in these countries. There are major differences in the regulatory and operating environments of each nation, as well as in geography, use of equipment, levels of freight and passenger activity, and reporting requirements/accident definitions. This complicated any accurate cross-country comparisons.

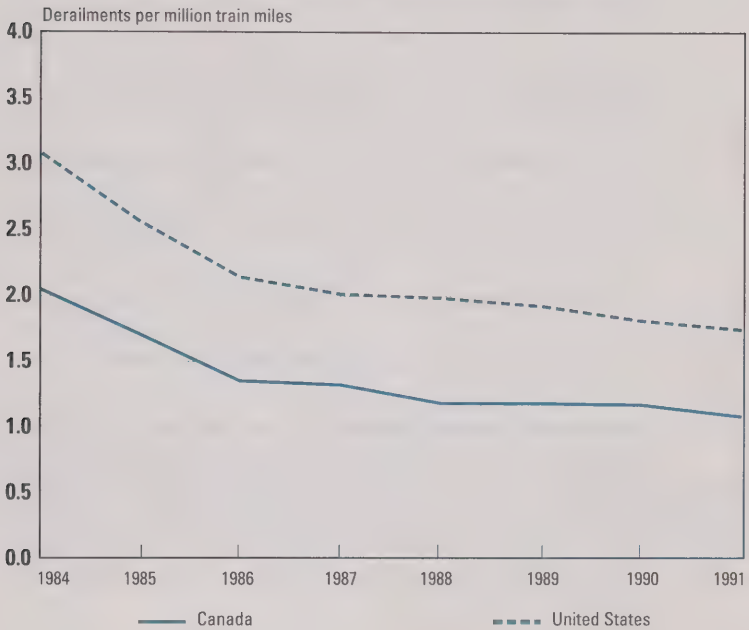
Despite the many differences, some common trends were discernible that led the Committee to assert that, in a comparative sense, Canada's rail safety record is in line with what is happening in other developed countries. Accident trends in Canada since 1987 are consistent with rail accident trends in the countries examined. While there has been an overall improvement in the level of railway safety in several of these nations over the last 20 years, the trend has been less pronounced more recently, as is the case in Canada.<sup>8</sup>

Because Canada and the United States are similar in industry structure, the Committee felt that the United States offered the best opportunity for a true comparison of the safety of rail operations. In total, the number of train accidents in the United States, as in Canada, has been relatively constant over the last six years. In 1987, a total of 2,512 accidents were reported in the United States, while 2,359 were reported in 1992.<sup>9</sup>

Therefore, in terms of the levelling off of accidents, Canada and the United States exhibit a similar trend. However, in some respects, Canada has historically been safer than the United States. For example, as shown in Figure 2.5, the rate of main track derailments (a key evaluative statistic, according to the TSBC) continues to be lower in Canada than in the United States on a per million train miles basis. Further, CN and CP have consistently placed among the top five North American Class I railways for the past decade in terms of lowest accident rates, excluding grade crossing accidents.<sup>10</sup> These comparative indicators support the Committee's belief that, safety-wise, the Canadian record is excellent. This is further demonstrated by an examination of the safety levels of trucking, the rail industry's main competition for freight haulage.



**Figure 2.5**  
**CANADA-U.S. MAIN TRACK DERAILMENTS**



*Note:* Canadian rates have been adjusted to most closely approximate U.S. reporting criteria.

*Source:* TSBC, "A Special Study of Main Track Derailments," Report No. SR9401 (Ottawa: Minister of Supply and Services Canada, 1994), p. 20.

## RAIL VS. TRUCKING SAFETY

Recently, the railway industry has been faced with an increasing competitive challenge from the trucking industry. While the railways have been able to meet this challenge with some success, this Committee's concern is safety. Given the trade-offs that government must make between the two modes, it seemed wise to compare rail's record with that of the main alternative to rail transportation. The Committee therefore commissioned a profile on commercial vehicle safety in Canada to compare rail safety with that of the trucking industry, recognizing that trucking will continue to dominate short-haul markets. The Committee then compared the safety performance of the two modes.

For the period 1989–1992, the average annual number of accidents for the trucking industry was estimated at 60,587, compared with 915 in the rail mode.

The average number of fatalities in the same period as a result of accidents involving commercial vehicles was 686. In the railway industry, the corresponding number was 126.

As Table 2.1 indicates, rail has a better record than trucking in terms of both accidents and fatalities *per billion tonne-kilometres*. When comparing the rates of truck and railway accidents, it is more useful to use tonne-kilometres as the measure of exposure. This measure recognizes the fact that railway carriers transport a greater volume of goods than trucks (about 250 billion tonne-km annually versus the trucking transport output of between 50 and 100 billion tonne-km per year). In other words, many trucks are needed to transport the same volume of goods that one train can carry over the same distance. To compare the safety of the trucking and railway industries accurately, it is important to take into account the volume of goods being transported.

<b>Table 2.1</b> <b>COMMERCIAL VEHICLE SAFETY VS.</b> <b>RAILWAY TRANSPORT SAFETY</b>		
Safety parameter	Commercial vehicle	Railway
<b>Reportable accidents<sup>1</sup></b> (4-yr average) Short-term trend (4-5 yrs)	60,587 vehicles/yr Declining	915 accidents/yr Variable
<b>Casualties (4-yr average)<sup>2</sup></b> Fatalities (# deaths/yr) Injuries (# persons injured/yr)	686 16,900	126 428
<b>Safety performance<sup>3</sup></b> Estimated accidents per billion tonne-km Estimated fatalities per billion tonne-km	1,169.34 13.88	3.63 0.50

*Notes:*

1. Commercial vehicle safety data represent the number of vehicles in collisions. Railway data, on the other hand, reflect the number of accidents.
2. Refers to casualties resulting from collisions involving at least one commercial vehicle.
3. Commercial vehicle accident rates are based on 1991 data. Railway accident rates are based on four-year averages for 1989-1992. The commercial vehicle accident rates should be interpreted only as rough estimates, since the vehicle-kilometres and tonne-kilometres used for exposure measures exclude private carrier operations and probably also understate for-hire carrier utilization.

Source: Resource Systems Management International Inc., "Profile of Commercial Vehicle Safety in Canada," Report prepared for the Railway Safety Act Review Committee, October 1994, pp. 6-2, 6-3.

The number of trucking accidents and the fatalities resulting from these accidents have been declining slowly since 1989, but the overall picture is very clear. Trucks are involved in significantly more accidents than trains and cause more deaths and injuries.

As transporters of dangerous goods, trucks again have a poorer safety record than railways. The average annual number of reportable dangerous goods accidents for trucks in Canada (between 1989 and 1993) was 225, while for railways it was 58. In terms of the volume of dangerous goods shipped, railways had a rate of 3.6 accidents per million tonnes transported, while trucks had a rate of 6.8, nearly double that of railways (see Table 2.2).

In summary, according to the most reliable measurement variables available — such as accidents per billion tonne-kilometres and number of fatalities — the railway industry is clearly much safer than its modal competitor.

Table 2.2 COMPARISON OF TRUCK-RAIL SAFETY IN THE TRANSPORT OF DANGEROUS GOODS		
	Truck mode	Railway mode
Annual tonnes transported	33 million	16 million
Reportable accidents (5-yr average)	225	58
Accident rate estimate per million tonnes	6.8	3.6

Source: Resource Systems Management International Inc., "Profile of Commercial Vehicle Safety in Canada," Report prepared for the Railway Safety Act Review Committee, October 1994, p. 6-5; and interview.

## CONCLUSION

Overall, the total number and rate of railway operational accidents do not appear to be changing significantly.<sup>11</sup> The recent safety plateau may be attributable to many factors, one possibility being the temporary exhaustion of technological improvements. The Committee was unable to confirm that the *RS Act* has had any impact on safety. The Act's impact appears to have been more evident in the safety management framework and in the efficiency of railway companies.

The Committee concludes that railways in Canada operate safely. On the basis of numerous evaluative measurements and comparisons with other nations and modes of transportation, the railway mode is an extremely safe means of moving freight and people in this country.

*The Committee concludes that railways in Canada operate safely. On the basis of numerous evaluative measurements and comparisons with other nations and modes of transportation, the railway mode is an extremely safe means of moving freight and people in this country.*

We should not accept the current safety levels. The goal is to improve those levels, and this goal can be attained by a more efficient use of available resources by both railways and regulators.

A prime area of concern continues to be grade crossings, a problem shared by many of the other countries examined. The Committee considers this issue to be of such importance that it merits its own discussion in Chapter 6.

## NOTES

1. In keeping with Canada's use of the metric system of measurement, the Committee attempts to describe distance in terms of kilometres. This is not always practical, however, given the railway industry's use of miles in such cases as "mile-post." Accordingly, this report utilizes both miles and kilometres in different situations.
2. The changed reporting requirements since 1980 are numerous and complex. The adjusted data series for Figure 2.1 is explained by the TSBC on pp. 45–46 of its report entitled "A Special Study of Main Track Derailments," Report No. SR9401 (Ottawa: Minister of Supply and Services Canada, 1994).
3. TSBC, *Annual Report, 1993* (Ottawa: Minister of Supply and Services Canada, 1994), p. 9.
4. *Ibid.*
5. IBI Group, "The State of Railway Safety in Canada," Report prepared for the Railway Safety Act Review Committee, September 1994, Exhibit 4.21.
6. TSBC, Railway Occurrence Report No. R92T0183, pp. 7–8.
7. From consultations with the Railway Safety Directorate and railway industry, and discussion with the TSBC.
8. Hickling Corporation, "International Comparisons of Rail Safety Practices," Report prepared for the Railway Safety Act Review Committee, August 1994, p. III.
9. Hickling Corporation, *op. cit.*, p. 2-2.
10. Interviews with CN and CP.
11. If an adjustment is made for changes in reporting requirements, there may be a slight downward trend, but this is not statistically significant.

## THE RAILWAYS: ROLES AND RESPONSIBILITIES

*Everyone agrees that safety  
is good business.*



### INTRODUCTION

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Canadian railways have long taken a lead in many safety-related areas. This chapter examines what these rail companies currently do to make their operations safe and the role they should play in this regard in the future.

As railways first began to appear in Canada, there was considerable concern that their powerful machines would expose the people who rode them, as well as those who lived or worked near the newly laid tracks, to danger. The technology was new and developing, and the costs for obtaining the equipment, as well as for laying the track, were very high. As a result, early Canadian railway legislation was very detailed, prescriptive and rigid, providing government and its structures with a prominent regulatory role in ensuring that railways in Canada operated safely.

Unlike the fledgling industry of the nineteenth century, Canadian railways today are both mature and sophisticated, with a culture to reflect these attributes. Railway companies now routinely offer comprehensive training programs and employee assistance programs and are involved in research and development activities. Their industry associations provide support and information services for both small and large railway companies.

The Commission of Inquiry into the Hinton train collision of 1986 criticized the railway culture of the time (at CN) which created, in the report's words, "an environment in which otherwise well motivated and responsible people throughout the company place inadequate priority on safety and, in effect, give tacit acceptance to rules violations that affect the safety of CN's rail operations."<sup>1</sup> The Committee believes, on the basis of its review, that the industry now gives safety a high priority. It has taken a number of steps towards improved safety, although there are still areas where there is room for greater initiative and further improvement.



The Committee also believes that the railway industry now has the expertise required to ensure safety advances in the future, and is experienced, safe and stable enough to be given greater control and responsibility over its daily operations.

## HOW THE INDUSTRY MANAGES SAFETY

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The railway industry has multiple roles in ensuring rail safety. The major Class I railways have full-scale safety programs that extend throughout a number of branches and departments, from the regulatory area to equipment and track maintenance departments. These programs span all levels, from trainee to senior management. Among the short line operators studied by the Committee, senior management is responsible for safety.

The North American rail industry has established professional representative associations that serve a variety of safety functions. In Canada, the Railway Association of Canada (RAC) has 27 railway company members and serves as a means of transmitting railway viewpoints to the Railway Safety Directorate (RSD). The Association of American Railroads (AAR), with over 750 employees and membership covering the North American Free Trade Agreement (NAFTA) nations, provides safety research and testing resources to the North American rail industry. It undertakes lobbying initiatives on the industry's behalf and offers administrative support to the member railway committees in the areas of standards development, research, identification and resolution of safety and operating issues and development of interchange rules for equipment.

Both the RAC and AAR are very active with regard to safety issues directly affecting the public. For example, the RAC administers the Operation Lifesaver educational program, while the AAR has spent considerable time and effort improving the industry's approach to the transportation of dangerous goods. To this end, the AAR is developing a risk management model that could serve as a framework for industry safety decisions. Clearly, this sector's industry associations play a major role in safety practices and overall safety enhancement.

**Table 3.1**  
**PROFILE OF THE CANADIAN RAIL INDUSTRY, 1993**

<b>EQUIPMENT AND OPERATIONS:</b>	
Miles of track operated <sup>1</sup>	44,200 (71,131 km)
Freight cars in service	112,345
Locomotives in service	3,194
Carloads originated	2,984,737
Tons originated	218,785,000 (198,477,000 tonnes)
<b>REVENUE (\$000s):</b>	
Total	6,638,484
Freight	5,841,539
Passenger (government funding and STCUM excluded)	274,870
Other	460,060
Freight revenue per ton-mile	3.50 cents (2.40 cents per tonne-km)
<b>EMPLOYEES:</b>	
Average number of employees	57,410
<b>ANNUAL RIDERSHIP (PASSENGER):</b>	
VIA	3.6 million
Commuter rail systems <sup>2</sup>	34.6 million
Rapid guided ground urban transit systems <sup>3</sup>	426.6 million

*Notes:*

1. Includes track over which railway has operating rights.
2. Toronto GO Transit and Société de Transport de la Communauté Urbaine de Montréal (STCUM).
3. Montreal Metro, Toronto Subway, Edmonton LRT, Calgary C-Train, Vancouver Skytrain.

*Sources:* Railway Association of Canada, *1994 Railway Trends* (Montreal: The Railway Association of Canada, 1993); and Committee sources.

## RAIL SAFETY MANAGEMENT

The Committee found that the Class I railways attach appropriate importance to safety from a corporate perspective. CN's mission is "to meet our customers' transportation and distribution needs by being the best at moving their goods on time, safely and damage free."<sup>2</sup> At CP, safety is one of five company objectives, and daily injury and significant-occurrence reports go to the Chairman, who has direct responsibility for safety.

However, the Committee's research indicates that, despite their commitment to safety, the railways do not have in place corporate frameworks to address all aspects of safety.

None of the operating departments of any of the railways interviewed has a defined, formal risk management program. As noted, the AAR is developing industry-wide initiatives in this area with respect to

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the transport of dangerous goods. Its model is anticipated by year's end, and it represents the first major rail industry initiative to put safety decisions in a risk management context. Nonetheless, safety aspects are already reflected in the decision-making process in several ways.

The Committee heard that normal safety activities are viewed as a cost of doing business and are not subjected to cost-benefit analysis. The departments responsible for employee safety programs at CN and CP indicated that, once safety

program initiatives are defined, requests for funding of those programs are made and to date no request has been rejected. One railway official noted that this open budget approach is not practised by all North American railways.

One railway indicated that employee safety improvement is one of its criteria to justify resource expenditures. It is not, however, given a formal framework or threshold requirement. A request for funding for a safety initiative is usually qualitative in nature and includes discussion of the general benefits to employee safety and the associated benefits of improved employee relations and corporate image. Types of investments justified in this way are better training programs, safety clothing and bridge safety railings for maintenance personnel.

CP Engineering promotes safety via its new compensation program for supervisors and managers, which has a performance component. Safety, one element of the performance measure, is automatically part of the decision process by which managers and supervisors allocate their personal time and effort.

At VIA Rail, public safety has a higher profile because of the fine line between “public” and “customers.” VIA sees a more direct link between public perceptions of safety and ridership, as well as public support for the entity itself. It carries this view even further in operating in some instances to standards it says are higher than “necessary.” The Committee was told that VIA “doesn’t want to leave *anyone* at risk because of adherence to minimum standards.”<sup>3</sup>

Corporate safety objectives typically include both employees and the public. The railways’ primary concern with respect to the public is to prevent accidents and derailments. The railways told the Committee that they focus their safety efforts on what they can control. Although they are concerned about accidents involving vehicles on railway crossings, railway personnel direct their primary safety efforts towards the provision of a safe transportation service by the engineering and equipment departments. Safety is viewed as a subset of the overall operating function of those departments.

Railways told the Committee that issues of “public safety” (i.e., grade crossings) should not be solely a railway responsibility. In their opinion, several sections of the *Railway Safety Act (RS Act)* put the onus for safety completely and unfairly on the railways.

Concerning safety at grade crossings, the railways see these crossings as more a highway issue than a railway one. The RAC stated:

There is no question that the railways will respond to safety issues that are wholly within their control. There are, however, certain areas where the railways interface with the public where safety is not solely a matter of railway safety, but a much broader one of public safety.<sup>4</sup>

Apart from crossing system installation, the railway industry contributes funds and effort to “public safety” issues through programs such as Operation Lifesaver. Railways cite other educational programs, substantial railway police forces and the installation of ditch lights on locomotives to illustrate their efforts to reduce the risk of crossing accidents and cut down on the level of trespassing on railway property.

The Committee was impressed by how seriously the railways take the issue of public safety, but was puzzled by their lack of initiative on grade crossings. It found no instance where a railway company has fully paid for an upgrade to a public grade crossing. The Committee,



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however, sympathizes with the railways' position that they should not have sole responsibility for the public's safety at crossings. In Chapter 6, the issue of safety at grade crossings is examined in more detail.

Although it is recognized that the rail safety record in Canada is good, the Committee does not view the status quo as acceptable. The figures indicate that the railways have done a good job in managing rail safety, but that there is still room for improvement. Based on their solid performance to this point, they are ready for greater responsibilities.

The railways have traditionally operated in a very prescriptive regulatory environment, and some of their actions (or inaction) continue to reflect this philosophy, despite their apparent support for a less prescriptive, more performance-oriented approach to the regulation of rail safety. For example, the Committee heard of situations where the railways had waited for a directive from a railway safety inspector before improving sightlines at certain grade crossings. While it is understandable that time is required for a corporate culture to change, the railways must speed up that process if they wish to — as the Committee believes they can and should — take on more safety responsibilities.

## SPECIFIC RAILWAY INITIATIVES

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The Committee's research and consultations demonstrate that the Class I railways, as well as short line operators, have the technological and managerial capacity to maintain and improve safety without substantial regulatory involvement in their operations.

In recent years, Canada's railways have undertaken many innovative safety activities, independent of the formal provisions of the Act or urging from the regulator. For example, at one of its subsidiaries, CP has adopted a "reengineering" safety program within its engineering



department, which resulted in a dramatic decline in personnel injuries from 75 to 2 per annum over a three-year period.<sup>5</sup> The program involves a significant culture change, with a shift from reactive to proactive initiatives. Training for both managers and employees focuses more on safety and less on rules. A safety auditor position has been created, independent of the supervisor, and that auditor has the same degree of authority as the Chief Engineer where safety matters are involved.

## Implementation of Technologies

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In recent years, Canadian railways have taken the lead in advancing technology to improve safety. For example, CN modified the front of its locomotives with a device to reduce the likelihood of overclimb in a collision and of cab penetration from projectiles. Such initiatives are only now being adopted by the U.S. railroads. The Canadian railways also introduced the use of reset safety control devices (on the recommendation of the Foisy Commission<sup>6</sup>) and ditch lights, which are intended to make locomotives more visible.

North American railway activities in the area of advanced train control systems (ATCS) were sparked by Canadian railway initiatives. ATCS were a Canadian concept to improve the train management system with a view to realizing improvements in safety and efficiency. In fact, the concept was under study by the Canadian railways at the time of the Hinton train collision. Following the Hinton collision and some high-profile U.S. train collisions, the focus of the ATCS initiative shifted from improved efficiency to potential safety benefits. To this point, the industry has not found operating savings sufficient to justify full implementation. The Canadian railways have invested in the development of test segments more as a post-Hinton commitment to regulators than for operational reasons. As a result of research into ATCS systems, computer-aided dispatching for unsignalled lines has been developed and is in operation. Two pilot schemes in Canada have used data radio links to transmit train operating orders to the crew (see Chapter 10 for further discussion of ATCS).

The use of hot box detectors and event recorders was established by the railways well before the RSD required these enhanced devices. CN's and CP's research departments are also recognized for their contributions to industry understanding of issues of track/train dynamics. CN implemented wheel impact detectors and initiated discussions that led to an industry-wide change of wheel changeout rules in this area.

### **Railway System Monitoring and Analysis Instruments**

Railways have in place a variety of event recorders and other equipment to accumulate safety-related information and monitor their rolling stock, track and other infrastructure, operations and some crossings, including:

- Constant warning time devices
- Hot box detectors
- Train control centres where train operation parameters are recorded
- Event recorders at automatic interlockings
- Track geometry cars
- Strain gauging of track and bridges
- Automatic Equipment Identification (AEI)

#### **Equipment being used at CP on a trial basis:**

- AAR's Freight Equipment Environmental Simulation Testing (FEEST) Car (spray-paints the track where it encounters a condition that causes a stress level in any of the car's components that exceeds design values)
- AAR's Track Loading Vehicle (TLV) (applies a constant lateral load to the gauge side of each rail and continually measures the lateral movement of the rail, providing a direct measure of the condition of the track ties with respect to their gauge-holding ability)
- One-Wheel Impact Load Detector (activated to identify wheels to be replaced on coal trains only, to determine its appropriateness for wider application in the management of freight car wheels)

### **Human Factor Initiatives**

Because human error accounts for a significant proportion of accidents (in rail as in other transportation modes), the major rail companies have focused energy and resources on human factor initiatives. CN introduced changes to its locomotive cabs, in consultation with the unions, to improve comfort and ergonomics. As well, CN, CP and VIA Rail have all devoted significant funding to research on the issue of fatigue among running crews. During the Committee's consultations, it was noted by CN's senior safety officer that, while they have in the past concentrated on infrastructure, they realize that any new safety gains will most likely be through human factors. The Committee views this as responsible management.

Both CN and CP have modified their training programs to stress the idea of safety to employees rather than the memorization of rules by rote. CP recently evaluated the effectiveness of its training program by testing running-trade employees on knowledge retention of their last training program. CN's senior training officers are attempting to make internal rule books less technical and more user-friendly.

Perhaps most significantly, the industry seems to have widely embraced a program of root-cause analysis in investigating accidents involving employee injury. This program is known as SCAT — System Cause Analysis Techniques. The previous focus on laying blame and taking disciplinary action has been replaced by investigation of the root cause of or contributing factors to an incident. In effect, the focus is now on why something happened rather than what happened and who caused it. For each event, a direct cause is identified and, from this, an underlying cause is pinpointed. The control action needed to address the underlying reason is then identified. Although it was thought to be very unlikely only a few years ago, it is now possible to investigate an incident in a systematic way, with cooperation between union and management, that attaches no blame and takes no disciplinary action.

One important effort has joined CN, CP, VIA Rail and the Brotherhood of Locomotive Engineers in cooperatively developing a program to reduce fatigue and increase alertness on the Canadian railways. The purpose of the project is to test and implement available measures to counter fatigue, to initiate (in collaboration with Transport Canada) a research program “to evaluate whether Performance Based Standards could eventually substitute for Hours of Work and Rest regulation”<sup>7</sup> and, in the long term, to develop human alertness technologies.

All the Class I railways have employee assistance programs (EAPs) in place to deal with any personal, health and work-related problems. These programs offer a range of counselling and educational services and differ from company to company. EAPs were implemented largely in response to substance abuse problems, and this remains a central focus. These programs will be discussed again when the issue of drug and alcohol use on the railways is examined (Chapter 8).

## Labour Viewpoint

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Railway safety management and policies were also addressed in the Committee's consultations with unionized labour groups. A common concern that was voiced was that current downsizing of railway staff

has led to a potential for reduced safety. One union noted that, previously, there were human operators acting as liaisons between crew and dispatchers; with this system, there were checks and balances. With the new automated system, these checks and balances do not exist. It was also suggested that the high number of derailments that occurred in Northern Ontario during the '93-'94 winter could be attributed in part to the reduction in maintenance of way as a result of staff cut-backs. While the railways have blamed the abnormally cold weather, one union alleged that:

It seems the railways are absolved from their legislated requirement to provide quality safety repairs. Instead, railways are adapting rules and regulations to meet a downsized worker complement in a feeble attempt to satisfy safety requirements.<sup>8</sup>

The Committee was concerned with whether downsizing had an effect on railway safety. Its research concluded that there was a decline in

*The major railways have indicated to the Committee that they would support a more progressive regulatory regime that embraces the use of performance standards and a larger role for the railway in setting and meeting those standards. This would provide flexibility, allowing railways to set the most effective and appropriate standards and rules for their particular company.*

equipment and infrastructure staffing, but also a reduction in workload. The research, and that of the Transportation Safety Board of Canada (TSBC), did not find a corresponding direct increase in derailments that might be linked to a reduction of maintenance.

Another concern voiced by unions related to the rule-making process under Sections 19–20. They felt that the railways have not given

sufficient consideration to union views despite the requirement for consultation with unions. Furthermore, unions told the Committee that they do not receive notice of any exemptions to rules, which deprives them of the opportunity to provide input.

It was also suggested that railway companies, in their efforts to reduce costs, apply standards that are the absolute minimum for safety and therefore do not allow any margin for error. The Committee was not able to confirm this perception. Some unions are wary of any shift to performance standards and the reduced role of government with respect to rail safety, in spite of the railway companies' demonstrated effort to achieve a high standard of safety and general trends abroad in the railway industry towards self-regulation.

## THE IMPACT OF MARKET FORCES

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Everyone agrees that safety is good business. The Committee heard from railways that safety practices are both driven and inhibited by factors such as the market and government.

Both major railways indicated that the direct costs of derailments are significant and that market forces demand a trouble-free railway. The largest components of these market forces are not safety-related but service-related. Both railways place more importance on service. The perceived costs of derailments have increased in recent years through recognition of the disruptive impact a derailment has on service. The Committee was told that much higher litigation costs in the United States have not led to safer operations there, and that the Canadian railways' existing service quality-oriented resource allocation processes are effective with respect to safety.

The AAR issues orders regarding railway operations and equipment. Canadian railway companies are represented on AAR committees and adhere to some AAR standards. Whereas Canadian orders do not involve penalties for non-compliance, sensitivity to market-place realities makes voluntary compliance desirable. This is reinforced through the actions of the Canadian Manufacturers' Association (CMA), which provides compliance information to its membership.

The Committee was told that the ability to introduce new and effective railway initiatives under Section 20 of the *RS Act* has not fully lived up to the railways' expectations. One particular example is the new track standards that the regulator asked the railways to develop and submit under Section 20.<sup>9</sup> In the absence of agreement among the railways on track standards, the regulator suggested that the very specific Federal Railroad Administration (FRA) standards be submitted as a rule. This is in fact what happened, even though Canadian railways believe that their accident record showed that they outperformed U.S. railways in track safety when they were operating under their own guidelines and that FRA standards were therefore unnecessary. The railways saw the regulator's informal insistence that there be a rule on track standards under Section 20 as unnecessary and counterproductive to safety advancement. They reasoned that the focus on the FRA standard, which permits manual measurement, diverted effort away from the real safety relationships which, although measurable with automated geometry cars, cannot be measured manually.



## THE FUTURE ROLE FOR RAILWAYS

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The major railways have indicated to the Committee that they would support a more progressive regulatory regime that embraces the use of performance standards and a larger role for the railway in setting and meeting those standards. This would provide flexibility, allowing railways to set the most effective and appropriate standards and rules for their particular company.

*Eight years after Hinton, it is clear that the railways have demonstrated a progressive attitude towards safety. Taken in conjunction with the major safety role played by industry associations, the Committee feels comfortable in advocating that the railways should assume a larger self-regulating role, with, in the public interest, the government limited to setting broad safety objectives.*

The railways consider that, under such a regime, the role of the regulator could be that of auditor of the railways' compliance with their own safety standards.

Eight years after Hinton, it is clear that the railways have demonstrated a progressive attitude towards safety. Taken in conjunction with

the major safety role played by industry associations, the Committee feels comfortable in advocating that the railways should assume a larger self-regulating role, with, in the public interest, the government limited to setting broad safety objectives. The Committee feels that, as much as possible, railway safety matters, such as construction, maintenance and operations, are best left in the hands of the railways.

There will always be areas where safety can be enhanced, and the Committee would like to see an improvement in the safety record rather than a continuation at the current level. Nevertheless, the Committee believes that the railways have done a good job with respect to rail safety. The Committee also believes it is time to move forward and allow the railways a greater role in determining how safety is to be achieved in the railway industry. The railways would then be better able to apply their expertise to improve rail safety in Canada.



## NOTES

1. Commission of Inquiry, Hinton Train Collision, December 1986, p. 5.
2. G.W. English and Associates, "Railways' Safety Management," Report prepared for the Railway Safety Act Review Committee, August 1994, p. 9.
3. *Ibid.*, p. 10.
4. RAC, Submission to the Railway Safety Act Review Committee, May 1994, p. 2.
5. G.W. English and Associates, *op. cit.*, p. 10.
6. Commission of Inquiry, Hinton Train Collision, p. 159.
7. M. Moore-Ede, *Canadian Railway Operating Employee Alertness Assurance Program*, Progress Report to Transport Canada, August 1994, p. 89.
8. Canadian Auto Workers, Submission to the Railway Safety Act Review Committee, pp. 12–13.
9. While one would normally expect that rules proposed under Section 20 would be done so under the railways' own volition, in this instance Transport Canada led the railways to believe that, if they did not submit track standard rules under Section 20, Transport Canada would require the railways to do so under Section 19.

## THE LEGISLATIVE FRAMEWORK

*There are still in effect  
many archaic regulations  
and orders from institutions  
that no longer exist.*



The role of the government as regulator of rail safety matters is dictated by the provisions of the *Railway Safety Act (RS Act)*. The Committee thus considers it useful at this point to examine the contents of the Act.

### ***The Railway Safety Act***

The *Railway Safety Act*, “An Act to ensure the safe operation of railways,” has six main parts. Under Part I, the Governor in Council (GIC) is empowered to make regulations regarding the engineering standards that are to govern the construction or alteration of railway works. It also details the process for initiating and undertaking railway works, and the Minister’s powers to authorize grants for those works and other undertakings that contribute to safe railway operations.

Part II outlines regulation and rule-making powers regarding the operation and maintenance of railway works and equipment. Under Section 18, the GIC is empowered to establish regulations governing the operation or maintenance of line and crossing works; the design, construction, alteration, operation and maintenance of railway equipment; and the employment of people in positions designated as critical to safe railway operations.

Section 19 authorizes the Minister to require railway companies, and Section 20 authorizes those railway companies, to propose new rules or change existing rules respecting any matter that has not already been dealt with by a regulation. Exemptions to regulations and rules can be granted by the GIC and the Minister, respectively, under Section 22.

Part III covers non-railway operations affecting railway safety. Under Section 24, the GIC is empowered to create regulations dealing with any non-railway activities, such as the removal of brush obscuring sightlines at crossings, that could threaten the safety of railway operations. Section 25 authorizes railway companies to enter land adjoining railway lines to undertake safety-related activities, such as clearing sightlines at crossings. The possibility of compensation for those suffering losses as a result of activities carried out under Sections 24 and 25 is detailed in those sections.

### ***The Railway Safety Act (continued)***

Part IV deals with the administration and enforcement of the *RS Act*. It details the Minister's power to appoint railway safety inspectors (RSIs), and to issue orders and emergency directives. It outlines the powers of RSIs to inspect railway and non-railway premises, and to issue Section 31 notices and orders in situations where a threat to safe railway operations has been identified. The requirement for company-sponsored medical examinations (subject to regulations that have not yet been made) is outlined under Section 35, and Section 40 indicates that public inquiries may be ordered by the Minister when a matter relating to safe railway operations is of public interest (e.g., a railway accident). Part IV also outlines the penalties for violating any provision of the *RS Act*.

Part V deals with miscellaneous provisions: it empowers the Minister to establish a Railway Safety Consultative Committee and details the make-up of this Committee; it allows for regulations made under the *RS Act* to incorporate by reference any classification, standard or procedure; and it requires that all regulations be made available for public review in the *Canada Gazette* at least 90 days before coming into effect.

Finally, Part VI details amendments to other legislation that are necessary to bring them into line with the *RS Act*. It also outlines transitional provisions for dealing with regulations, orders and by-laws that were created under the *Railway Act* and that remain in force until they are revoked by the GIC or the Minister.

## **FEDERAL JURISDICTION REGARDING RAIL SAFETY**

In Canada, railways may be under either federal or provincial jurisdiction. In accordance with Section 92(10)(a) of the *Constitution Act, 1867*, a railway connecting a province with any other province or extending beyond the limits of a province is within the legislative authority of the Parliament of Canada. On the other hand, a railway that is situated wholly within a province is within the legislative authority of that province, unless it has been declared by Parliament to be a work "for the general advantage of Canada or for the advantage of two or more provinces" pursuant to Section 92(10)(c) of the *Constitution Act, 1867*.

CN's railway clearly extends beyond the limits of a province and, by that fact alone, comes within the legislative authority of Parliament. Consequently, it may be asked whether Section 18 of the *Canadian*

*National Railways Act (CNR Act)*, which declares the railway to be a work for the general advantage of Canada, is redundant. This declaration was required since, at the time of its creation, CN comprised a number of railways, some of which were located entirely within a province.

Once a railway has been declared a work for the general advantage of Canada, that railway remains within the legislative authority of Parliament, irrespective of any subsequent conveyance, until Parliament repeals the declaration. For example, a line of railway conveyed by CN to a company incorporated by a province, even if the line were situated wholly within the province, would remain within the legislative authority of Parliament by virtue of the declaration set out in Section 18 of the *CNR Act* unless the declaration was repealed. This situation is addressed in Section 6(3) of the *Railway Act* and Section 158(4)(d) of the *National Transportation Act, 1987 (NTA, 1987)*.

A railway company otherwise within the legislative authority of a province is, in limited respects, subject to some provisions of the federal *Railway Act* even in the absence of a declaration that it is a work for the general advantage of Canada. Indeed, Section 8 of the *Railway Act* states that its provisions on the following matters apply to provincial railways:

- (a) the connection or crossing of one railway with or by another, in so far as concerns the connection or crossing;
- (b) criminal matters, including offences and penalties; and
- (c) navigable waters.

## PROVINCIAL JURISDICTION

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The federal government and all provinces except Prince Edward Island and Newfoundland are involved in the regulation of railway safety. As the Class I railways rationalize their networks, the existence and expected growth of short line railways across the country focuses attention on the issue of provincial rail safety regulation, which is reviewed in Chapter 9.

The safety problems associated with multi-jurisdictional involvement in grade crossings are explored in a subsequent chapter.

## THE FEDERAL LEGISLATIVE MANDATE REGARDING RAIL SAFETY

The *Railway Act*, originally enacted in 1904, constituted the source of all legislative provisions of general application dealing with railway safety operations prior to 1989. It was a self-contained statute that governed all aspects of a railway in its life-cycle, covering matters such as construction, standards for infrastructure and equipment, operations and maintenance, safety, accident reporting and investigation, tariffs and the level of services. Jurisdiction over these matters was conferred upon a single regulatory body, whose name changed several times over the years: Board of Railway Commissioners; Board of Transport Commissioners; Canadian Transport Commission (CTC); and, finally, National Transportation Agency (NTAgency). In addition to economic regulation, this body regulated all aspects of railway safety, including construction, operations and maintenance. The Agency also had supplementary powers to monitor for compliance, investigate accidents and issue orders to the railways regarding remedial action.

Throughout the 1980s, however, Parliament reviewed specific areas of railway regulation and operations, removed them from the purview of the *Railway Act*, provided each area with specific legislation and assigned administrative responsibility to a separate regulatory authority.

*The RS Act, combined with the enactment of the 1989 Canadian Transportation Accident Investigation and Safety Board Act, removed virtually all safety matters from the Railway Act and its administration from the purview of the CTC/NTAgency. This effectively created the institutional separation of rail safety regulation, accident investigation and economic regulation.*

In particular, responsibility for safety and economic regulation was transferred from the *Railway Act* to four more specific statutes, involving two independent regulatory bodies and two directorates within Transport Canada. The *Transportation of Dangerous Goods Act (TDG Act)*, enacted in 1980, was the first of these Acts. Since 1987, the *NTA, 1987* has provided the legislative framework for government policy

in transportation. The *NTA, 1987* assumed regulatory responsibility for economic matters regarding level of service, rail line abandonments and subsidy payments.

The *RS Act*, combined with the enactment of the 1989 *Canadian Transportation Accident Investigation and Safety Board Act (CTAISB Act)*, removed virtually all safety matters from the *Railway Act* and its administration from the purview of the CTC/NTAgency. This effectively created the institutional separation of rail safety regulation, accident investigation and economic regulation. One underlying rationale was to avoid any potential for conflict of interest between rail safety regulation and rail accident investigation. The organizational result was the creation of the Railway Safety Directorate (RSD) within Transport Canada for safety regulation (*RS Act*) and the Transportation Safety Board of Canada (TSBC), an independent agency, for accident investigation (*CTAISB Act*). The NTAgency retained control over economic regulatory matters, as outlined in the *NTA, 1987*.

The rail safety mandate of Transport Canada, as stated in Section 3 of the *RS Act*, is:

the attainment of such of the objectives of the national transportation policy, as set out in subsection 3(1) of the *National Transportation Act, 1987*, as relate to the safety of railway operations and as fall within the purview of subject-matters under the legislative authority of Parliament.

Furthermore, Section 3(1) of the *NTA, 1987* states:

. . . a safe, economic, efficient and adequate network of viable and effective transportation services making the best use of all available modes of transportation at the lowest total cost is essential to serve the transportation needs of shippers and travellers and to maintain the economic well-being and growth of Canada and its regions . . .

The *NTA, 1987* declares in detail in this subsection that the national transportation policy is to be based on a market-oriented system, with equitable treatment for each mode in bearing a fair proportion of the real costs of the resources, facilities and services provided to a carrier at public expense. The Committee sees the national transportation policy as striving to balance transportation safety with economic and competitive considerations.



## THE FEDERAL RAIL SAFETY ORGANIZATIONAL FRAMEWORK

The federal effort to deliver programs contributing in some manner to railway safety is spread across several agencies, directorates and departments.

Transport Canada's Surface Group is the main federal organization delivering rail safety services. It has three components, all reporting to the Assistant Deputy Minister (ADM) (Surface):

1. The RSD derives its mandate from the *RS Act*. The Act gives the GIC the authority to make regulations in all areas affecting railway safety (Sections 7, 18, 24, 46), as well as RSIs the power to ensure compliance through inspections and the imposition of orders (Sections 28–33). All senior officers of the RSD are RSIs.
2. There are RSIs at HQ and in the regions. Regional RSIs report, through regional directors, to the Surface ADM and not directly to the RSD. The *RS Act* empowers RSIs to carry out inspections of railway infrastructure and operations. All RSIs have the power to issue notices and orders, which are enforceable through the Federal Court.
3. The Transportation of Dangerous Goods (TDG) Directorate, which deals with all modes of transport and is empowered under the *TDG Act*, “promotes public safety in the transportation of dangerous goods.” To this end, its inspectors concentrate on the safety of the means of containment of dangerous goods, both while they are in transit and while they are being loaded and unloaded. The *TDG Act* emphasizes measures to be taken prior to undertaking the transportation activity itself. With respect to inspection and the compliance enforcement of dangerous goods regulations during transport by rail, some RSIs in the regions are accredited as TDG inspectors.

The NTA Agency, as established under the *NTA, 1987*, has no legal mandate to regulate railway safety, but it does have indirect influence through its roles in cost-apportionment and compensatory matters under Sections 16 and 26, respectively, of the *RS Act*. The Agency retains ancillary safety power under the *Railway Act* in exercising economic regulation over the entry of a new railway. Such regulatory approvals, although determined primarily on the basis of “public convenience and necessity,” do have an impact on rail safety.

The TSBC, created under the *CTAISB Act*, has two primary rail safety activities. It investigates transportation accidents, including rail accidents, and determines causes and contributing factors, and it also stores and analyzes accident data to identify broad transport safety problems and lessons learned.

Under the *Canada Labour Code*, the Occupational Safety and Health (OSH) Directorate of Human Resources Development Canada (HRDC) (formerly Labour Canada) is mandated to facilitate the achievement of a safe and healthy workplace. A Memorandum of Understanding (MOU) exists between HRDC and Transport Canada for the administration of the Code in regard to railways. Signed in March 1990, the MOU outlines the respective administrative roles of the two departments and covers coordination activities, enforcement of the federal OSH compliance policy, the training and appointment of Transport Canada OSH personnel, and accident investigation and reporting. RSIs are empowered to inspect for and enforce compliance regarding OSH violations affecting on-board railway employees.

## THE LEGISLATION AND ITS RESULTS

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### The *RS Act*: A Restructuring of Railway Legislation

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When railway legislation was being restructured, a serious effort was made to avoid unnecessary duplication and conflicting mandates. However, the removal of numerous functions from the purview of the *Railway Act* to that of other legislation made it difficult for the government of the day to ensure total coordination of all the ensuing pieces of enabling legislation and consequent regulatory authorities.

For decades, the federal government has struggled in both conceptual and practical terms with the issue of separating the economic, safety and other functions of transportation regulation. A myriad of reports and commissions in all modes, however, recommended that the separation of these various functions was necessary to avoid the perception of conflict of interest.<sup>1</sup> For example, the Canadian Transportation Accident Investigation and Safety Board Act Review Commission (1993) supported the separation of accident investigation from the main transportation safety regulation powers on the basis that it gave the accident investigator, among other things, the independence to challenge the regulatory apparatus and thus to enhance safety.



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Also notable is the fact that the *RS Act* moved safety into the hands of the Minister of Transport, whereas previously it had resided in the NTA Agency at arm's length from the department. This move was viewed as consistent with the principle that, since the Act conferred greater responsibility for safety on the railways, the Minister should have direct regulatory responsibility for safety as the elected official responsible for transportation matters and should be accountable to Parliament.

These were ambitious changes in transportation policy and regulation, but a number of inconsistencies or redundancies in legislation remained to be resolved. Some of those involving rail safety are discussed below.

## The *Railway Act*

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Some of the provisions remaining in the *Railway Act* seem redundant or confusing. For example, Sections 105–132 of the *Railway Act* deal with locating a railway line. Prior to constructing a line, a railway company must file with the NTA Agency a plan, profile and “book of reference” showing the proposed location of the line. Work may not commence until these documents have been sanctioned by the NTA Agency. Section 115(2) states that the Agency,

by its sanction shall be deemed to have approved merely the location of the railway and the grades and curves thereof as shown in the plan, profile and book of reference, but not to have relieved the company from otherwise complying with this Act.

In the same manner, Section 127(1) refers to changes in the “grades and curves as the Commission may direct.”

The *Railway Act* does not specify the criteria by which the NTA Agency should approve or direct changes to the grades and curves. The degrees of grades and curves are related to issues of safety, and the use of these words in Sections 115 and 127 of the *Railway Act* may be remnants of a period when the Agency had responsibility for construction safety in addition to matters of public interest. Under the *RS Act*, Transport Canada is now responsible for ensuring the safety of line works, including grades and curves. The Committee does not know what is achieved by maintaining NTA Agency authority over the same matter. Given Parliament's intent to place all safety matters under the *RS Act*, the Committee believes this to be a case for rationalization.

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#### RECOMMENDATION 4.1

**We recommend that the *Railway Act* be amended so as to eliminate duplicate safety provisions.**

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Given the nature of the mandates of the NTA Agency and the RSD, some overlap may be inevitable even if the legislation is amended. Of more concern is that some aspect of safety may be overlooked. Section 6 of the *RS Act*, which provides for coordination agreements between these two organizations, addresses this situation.

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#### RECOMMENDATION 4.2

**We recommend that coordination agreements as contemplated in Section 6 of the *Railway Safety Act* be implemented between the National Transportation Agency and the regulator to ensure all safety issues are addressed.**

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#### The *NTA, 1987*

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Immediately prior to the passage of the *RS Act*, safety regulation and investigation resided administratively in the NTA Agency. However, inconsistencies remain in that certain provisions under the *NTA, 1987* have

become either redundant or questionable as a result of the transfer of certain areas of jurisdiction from the NTAgency to Transport Canada.

For example, Section 35(3) of the *NTA, 1987* reads as follows:

The Agency may, on complaint or of its own motion, inquire into, hear and determine any matter concerning safety under any Act of Parliament that is administered in whole or in part by the Agency.

Matters and inquiries dealing with safety have clearly been transferred away from the NTAgency. When the *NTA, 1987* was enacted, this transfer of jurisdiction had not yet taken place. With the subsequent enactment of the *RS Act* and the *CTAISB Act*, this provision has become anachronistic, since it continues to confer upon the NTAgency a jurisdiction in respect of safety issues. It creates unnecessary ambiguity, and it conflicts with the underlying intention of the *RS Act* to transfer the regulation of safety to Transport Canada and of the *CTAISB Act* to shift the investigation of accidents to the TSBC.

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### RECOMMENDATION 4.3

**We recommend that Section 35(3) of the *National Transportation Act, 1987* be revoked.**

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Likewise, Section 150 of the *NTA, 1987*, dealing with the connection of the lines of two railway companies, is couched in such a manner as to deal not only with the service and economic aspects of the connection but also with its engineering and safety aspects. This section was formerly found in the *Railway Act*, and its wording reflects a period when the regulatory authority of the time, the CTC, had jurisdiction over economic, engineering and safety matters. The section should be amended to remove all reference to safety and to reflect more appropriately the Agency's jurisdiction.

The same situation is found in Section 152 of the *NTA, 1987* with respect to interswitching.

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## RECOMMENDATION 4.4

**We recommend that Sections 150 and 152 of the *National Transportation Act, 1987* be amended to remove all references to engineering matters and jurisdiction over safety matters.**

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### The *RS Act*

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Section 36 of the *RS Act* allows the GIC to make regulations respecting the railways' notification to the Minister of any accidents or incidents. Regulations have not been made under this section, and they should not be, given that the railways are required under TSBC regulations to report accidents and incidents to the TSBC. Railways have noted that any regulations made under the *RS Act* in this regard would be redundant, since this provision of the *RS Act* duplicates a function that rightfully belongs to the TSBC.

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## RECOMMENDATION 4.5

**We recommend that Section 36 of the *Railway Safety Act* be revoked.**

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## THE ROLE OF THE FEDERAL GOVERNMENT IN RAIL SAFETY

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### Economic Efficiency and Rail Safety

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As previously pointed out in this chapter, the intent of the national transportation policy, as stated in the *NTA, 1987*, is, in large part, to remove regulatory and legislative obstacles to the modernization and economic development of Canada's transportation system while maintaining transportation safety. The *RS Act* is the legislative vehicle to deal specifically with rail safety and is seen by Parliament as doing so in the overall context of the national transportation policy.



With legislative and organizational separation of safety and economic regulation, there are increased administrative and operational costs affecting both the regulator and the regulated. For example, one short line rail company suggested that the new framework creates difficulties, in that the industry now has to deal with three separate agencies. Each of these agencies, it was suggested, lacks the balance of approach between safety and economic issues that previously existed when there was “one-stop shopping” at the CTC/NTAgency. In addition, there is the simple incremental cost incurred by the government for the operation of multiple agencies rather than a single entity. While the Committee understands this concern, its mandate is focused on the safety aspects of the *RS Act* rather than on the cost of administration.

However, cost considerations as well as benefits figure in safety regulation. If costs/benefits are not considered when a regulator prescribes safety requirements, resources may be used in a wasteful manner, potentially compromising safety.

## The Regulatory Instruments — Effects and Impacts

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There are different levels and types of costs associated with the use of various regulatory instruments. Likewise, the instruments, depending on the environment in which they are applied and other factors, provide different controls, and these controls have varying degrees of effectiveness.

### ***Information Dissemination, Information Collection and Consultation***

One of the least intrusive means of regulatory control is to collect and disseminate information regarding an industry’s performance and activities. In competitive situations with strong client feedback mechanisms, information dissemination is often very effective in controlling unsafe business practices. With regard to rail safety, potential and actual shippers and passengers demand safe and reliable service and can impose those demands effectively by withholding business from railways that endanger the public or have unreliable service records. The same is true of all transportation modes.

The cost of this form of regulatory control depends on how the information is gathered. Public hearings or government-financed inspections are relatively costly. However, if available data from the railways are used, information dissemination becomes relatively inexpensive.

Available information on rail safety includes data on railway company operations, maintenance, accidents or incidents and even the requirement to provide public notice of proposed railway works.

***Inspection/Monitoring*** Railway company inspectors inspect railway infrastructure, equipment and operations. All Class I railways put a substantial effort into such activities. From profit-making and customer-relations perspectives, accidents are very expensive (since the railways must clear and repair damaged property themselves) and also detrimental to marketing. Moreover, a sound inspection and monitoring regime allows a railway to maximize the useful life of its equipment and infrastructure. Smaller railway companies, however, may not always have adequate inspection and monitoring regimes.

Technological developments in the railway industry permit an increasingly large amount of monitoring data to be generated and stored by machines. Much automated monitoring of railway systems and equipment is now done by Canada's major railways. This is especially important for the recording of operations violations and of the condition of infrastructure and equipment actually in operation.

Information on the condition of railway equipment, infrastructure and operations is only useful for safety regulation insofar as it can be interpreted with respect to the safety of the rail system's components. Lack of clarity on the safety effect of an identified defect or operational violation will minimize the usefulness of inspecting or monitoring such defects.

In terms of rail inspections, reported defects or violations have historically been identified in terms of deviations from design standards. This type of inspection may be meaningful for a given technology or type of operation, but the imposition of such design standards could limit or impede the technological improvements a railway can introduce. Indeed, a major drawback to the imposition of design standards is its retarding effect on technological introduction.

Inspections by people are both labour-intensive and expensive. In 1993, the salaries and benefits of RSD staff amounted to about \$9 million. That figure excludes the costs associated with railway staff accompanying federal inspectors or otherwise responding to their concerns.

As discussed earlier, one of the intentions of the *RS Act* was to provide railway companies with greater freedom to manage their operations safely and efficiently. The extent to which the inspection

activities of the regulator still follow an essentially prescriptive regime may be at variance with some of the objectives associated with the introduction of the *RS Act*.

Public policy may require that government rail safety inspectors retain their functions; however, the extent and nature of these activities should be changed to suit a more modern regulatory regime.

The federal government could, in the main, achieve the same objectives by replacing physical inspections with the ongoing monitoring and analysis of safety information provided by railway companies, accident investigators and auditors. Less frequent field inspections by the government would be necessary.

***Setting of Design Standards*** It is possible for the government to specify the precise process or engineering specifications that the railways are to use or follow in the delivery and management of railway services. But the imposition of such standards tends to freeze technological development.

One of the original intentions of the *RS Act* was to reduce the use of this instrument. There were many good reasons for this. Having the government set or approve design standards implies a heavy direct cost to the federal treasury and could also weaken the management of the railways. Moreover, the major railway companies are the main repository of rail safety expertise. The innovative rule-making scheme incorporated in the *RS Act* does not apply to the construction or alteration of railway works, so its flexibility has not been available for these elements.

A longer-term problem with the imposition of design standards is that, if railway companies must comply with rigid engineering specifications (for example, in track geometry or the condition of cross-ties) to convince a regulator that their infrastructure and equipment are safe, they are inhibited in their introduction and large-scale production of new machines to measure wear or operational characteristics and to develop more reliable measures of risk.

Most often, rail-related design standards are developed by railway associations or railway engineering associations. Typically, government regulators approve, rather than develop, such standards. It is clearly inefficient for the government to then put these standards through the regulatory process.

**Grants or Contributions** One of the traditional means of inducing behavioural change in railways has been to provide money for the requisite construction of signals, protection devices or other railway works.

The degree of effectiveness of control that this instrument provides depends on the general situation, the extent to which the recipient of the grant is willing to continue to maintain the work after it has been constructed or installed, and other factors. In this regard, the federal regulator has encountered no significant difficulties with Canadian railways.

The Grade Crossing Improvement Program, the primary example of such grants, is discussed in Chapter 6.

**Regulations and Rules** The body of regulation that accompanies the *RS Act* is extensive. There are also still in effect many archaic regulations and orders from institutions that no longer exist. The Committee was surprised to find so many of these, given that the Act was intended to be more modern. The general approach of the regulator has not changed materially and that appears to be a reflection of the fact that the regulations have not been changed.

The *RS Act* includes an innovative scheme for making rules, which have the effect of law (Sections 19 and 20). The implementation costs for legal rules depend on the formality, extent of consultation and nature of the process needed for establishing the rules. The promulgation of regulations under the existing federal process, for example, is both costly and time-consuming. By the same token, the regulatory process can involve extensive consultation and a high degree of due legal process. A less formal and less expensive approach is to require the railways to develop and implement their own safety rules, subject to federal approval and stakeholder consultations. The rule-making regime is also open to government initiation, in that the Minister may require a railway company to make a rule. This *RS Act* innovation allows for a faster response to changing circumstances and would appear to be an efficient replacement for regulations.

It would be even less expensive and more efficient to allow railways to manage their own safety affairs, with very little or no additional direction from the government as long as they maintained or exceeded specified safety goals. Such goals could be formulated by the railways and approved by government, as a form of performance standards.

One major advantage of such performance standards would be that they would be the least restrictive of the various regulatory instruments

in terms of allowing railway company management to develop and/or utilize new technology for railway infrastructure, equipment or operations. There are at least two areas in particular where intrusive regulatory instruments could retard the introduction of new and safety-enhancing technology. One is the development and introduction of new cars or locomotives that are less likely to derail in a minor collision, but that may not necessarily conform to existing design standards for rolling stock.

The second, and more important, area is the use of data. Advances in technology have resulted, as already noted, in an increasingly large amount of railway monitoring data to be generated and stored by machines. However, for this information to realize its full potential in terms of monitoring rail safety, a railway must be allowed to use the data to demonstrate that its infrastructure, equipment and operations adhere to safe standards. Hence, if the safety regulators were to rely on those same data (verified by safety audits undertaken by government or other independent certified rail safety auditors), major economies could be realized and technological advances in safety could be accelerated.

A key component of safety is thorough and timely maintenance of railway equipment and infrastructure. The monitoring of railway companies' maintenance schedules and activities could be covered by regular safety audits and, thus, inspections would not be required in cases where railways met the specified performance standards. This would realize important economies for both the government and the railways and would not restrict railway management in determining the maintenance scheduling and practices that are best for a railway.

Another major aspect of a safe rail system is high-quality railway management, and such expertise already resides in Canada's railway companies. Moreover, reliance on performance standards encourages initiative and innovation on the part of railway managers and employees at all levels. There are strong financial incentives for railway companies to avoid accidents, which are disruptive to business. Hence, a competent management team at a railway will strive for excellent safety performance.

In a previous chapter, it was concluded that the railways' approach to safety, their actual safety programs and practices, and the safety performance of the railway industry as a whole are all of a high standard. This is a tribute to all employees of the companies. In addition, the railways' theoretical and actual ability to monitor their systems and analyze the data has outstripped the regulator's own ability to monitor railway performance.



In subsequent chapters, it will be demonstrated that, although the regulator is unquestionably competent, the general nature of government inspections and monitoring of railways has not kept up with technology. It will also be concluded that, apart from grade crossings and trespassing, government involvement is no longer required at its current level.

These factors, combined with the flexibility that performance standards present, lead to the conclusion that adoption of an approach to safety based in part on high-level performance standards can result in greater safety value for the available resources, within both government and the railway industry. The Committee believes that the industry should take the lead by proposing these standards for the regulator's approval.

The Committee recognizes that the adoption of this approach will represent a significant culture change to both regulator and railways, and that this cannot take place overnight. It believes, however, that such a change will align the nature of the regulatory role more closely with the Act's original intention. A less prescriptive role will require a very different approach to monitoring activities, and this will be discussed in a subsequent chapter. Also, railway managers and employees will no longer be able to rely on being told exactly what to do by the regulator, and they may have to adjust their operations to take more initiative in and control of the safety of their operations.

The regulator, however, must not lose its expertise in the industry or its knowledge of the basic requirements for railroading. The regulator will still approve performance standards, and it will have to ensure that approved standards are compatible in key areas of the industry. Two examples of these basic standards are interchange rules and grade crossing rules. The regulator will also continue to act as monitor of the railways' actual performance and, as such, it must not lose its front-line inspection capability as it develops the skills to become a more modern monitor and auditor.

The performance standards<sup>2</sup> to be put forward by the railways will be filed as rules when approved by the regulator. Railways will respond to those standards by submitting their comprehensive safety plans. Both the standards and the railways' responses should have the effect of law. The *RS Act* provides an efficient means of doing so through the rule-making mechanism, and this means should be used.



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## RECOMMENDATION 4.6

**We recommend that the *Railway Safety Act* be amended to provide for a statutory framework that sees the railways propose performance standards and a comprehensive safety plan to implement the standards, both of which must be approved by the regulator. We further recommend that approved performance standards and safety plans be made binding on railway companies.**

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The Committee believes that this innovative approach will provide the flexibility to apply the Act to all classes of railway. The role of government as regulator may then turn away from its preoccupation with railway operations and be focused on:

- expansion of programs in which the major concern is public safety rather than railway safety;
- investigation of areas where macro safety performance standards have not been reached by the railways;
- monitoring and analysis of railway performance; and
- auditing of railway system safety programs.

Public safety considerations, especially in the context of grade crossings and trespassing, are not amenable to goal-setting, against which the performance of railway management can be evaluated. Railways simply cannot control all variables to prevent accidents in these areas. The latter should be monitored or controlled by more traditional regulatory techniques, combined with enhanced research into more effective and efficient ways of preventing crossing and trespassing accidents.

For some aspects in which public safety is concerned, the regulator currently employs guidelines rather than a regulation. The Committee recognizes that the regulator has adopted the philosophy that less regulation is better than more, but it has some concerns with the use of guidelines on matters that are so vital to public safety.

The Committee's primary concern is that the fact that minimum standards to protect the public are not optional is clearly stipulated. These standards should be incorporated into rules or regulations, and the regulator should be provided with appropriate enforcement tools. Currently, guidelines, such as those for grade crossings, do not have the force of law and, as such, may not be understood to be vital to the public interest. RSIs may enforce the guidelines only through the issuing of orders (Section 31 or 41), which were designed for more general application and hence may require judgment. The Committee is of the view that public safety issues should be given more prominence than guidelines can afford, and that these matters should be given the force of law so that both the requirement for public safety and the necessary criteria are clear to all concerned.

The Committee suggests that the rule-making provisions of the *RS Act* would provide the government with the same flexibility as it provides to the railways, and that this mechanism should be tailored to the government's needs in the case of public safety issues.

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## RECOMMENDATION 4.7

**We recommend that Section 19 of the *Railway Safety Act* be amended to allow the regulator to establish rules on matters of public safety.**

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As mentioned earlier, Section 20 of the *RS Act* allows a railway to formulate rules in respect of those matters set out in Section 18(1) of the Act. Therefore, to enable the railways to file comprehensive safety plans that would allow them to manage their own safety affairs, the Committee believes that the railways should also be permitted to file rules addressing engineering standards and the operation and maintenance of crossing works as set out in Sections 7 and 18(2) respectively of the *RS Act*.

## RECOMMENDATION 4.8

We recommend that the *Railway Safety Act* be amended to provide for authority for the railways to formulate rules under Section 20 of the *Railway Safety Act* in respect of those matters set out in Sections 7 and 18(2).

## RECOMMENDATION 4.9

We recommend that any existing guidelines concerning matters of public safety be put forward as regulator-sponsored rules.

## RECOMMENDATION 4.10

We further recommend that any rules sponsored or required to be filed by the regulator be subject to cost-benefit analysis.

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**Issuance of Orders** Orders are essentially a form of enforcement. The relevant provisions are in Section 31 of the *RS Act*.

Under Section 41, a person who contravenes a provision of the *RS Act* is guilty of an offence and is liable to conviction. Maximum fines are specified. This means of enforcement has not been used by RSIs, who rely instead on voluntary compliance and Section 31 notices and orders.

Section 31 grants extensive discretionary powers to RSIs. This provision of the *RS Act* relies largely on the expertise of RSIs to make judgments when there is a “threat” or “immediate threat” to safe railway operations. The inspector has a wide range of powers under this section and can give a “cease operations” order if the perceived threat is considered serious.

However, the section limits an inspector’s power to determine that a threat to safety exists if there is conformity with “all applicable regulations, rules and emergency directives.” It is noteworthy that guidelines were not included on this list; therefore, an inspector would still be

empowered to issue orders even if a grade crossing, for example, met the requirements of existing guidelines.

The Committee received representations from railways objecting to the power of inspectors derived from this section. They noted that there is too much subjectivity in the notion of “threat” and too much reliance on the opinion of inspectors. They also noted that there is no appeal mechanism, and that the economic effect of these orders could be severe.

The Committee does not wish to restrict the powers of inspectors who exercise their powers under Section 31 when they believe an unsafe condition exists. At the same time, the fact that there is no timely redress for those who are issued an order under this section of the *RS Act* seems inequitable.

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### RECOMMENDATION 4.11

**We recommend that the *Railway Safety Act* be amended to provide that Section 31(9) be revoked and that appeals of notices and orders issued under Section 31 be directed to a qualified, publicized body, independent of the regulator. We further recommend that there be a provision to permit a timely review and resolution of any appeals, with decisions from this body to be final, it being understood that orders are to remain in force until the appeal has been decided.**

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***Voluntary Compliance*** In terms of direct federal costs, this instrument is inexpensive. However, the overall benefits and costs of the use of voluntary compliance depend on the quality of the corrections requested by RSIs and accepted by the railways. The effectiveness of control depends on the extent to which the railway staff believe that the requested changes in behaviour are really necessary and beneficial.

### Regulatory Instruments That Have Been Used or Not Used by the RSIs

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Despite the stated intent to place more of the responsibility for safety on the railways, the *RS Act* still provides for many more instruments and actions originating with the government than with the railways.

The Act provides explicitly for those instruments. The RSD and RSIs have used the following regulatory instruments or powers:

- making new regulations (Sections 8, 11, 24(1)(b));
- enforcing existing regulations/orders/by-laws promulgated under the *Railway Act* (Section 119) and revoking out-of-date railway regulations (Section 119(5));
- requiring a railway to formulate or revise its rules (Section 19);
- requiring a railway to adopt or formulate engineering standards (Section 7);
- requiring a railway to provide notice of a proposed railway work (Section 8);
- providing grants for studies, special projects or the construction of some railway works (Sections 12, 13 and 14);
- issuing of orders;
- making formal agreements (MOUs) with government departments, excluding the NTAgency, regarding rail safety;
- conducting inspections of railway property and grade crossings (Section 27), carried out by designated RSIs with substantial enforcement powers (Sections 28–31), including the power to issue orders to withdraw from service, repair, maintain or operate in a specified fashion any railway work or equipment (Section 31).

Other actions taken or instruments used by the regulator that are not specifically included under *RS Act* authority are:

- issuance of guidelines;
- making formal agreements (MOUs) with the provinces regarding the provision of federal inspection and related services to provincially chartered railways;
- obtaining voluntary compliance by railway staff to repair or correct defects or infractions identified by the RSIs.

The *RS Act* also provides for the regulator to have numerous other instruments or powers which have not yet been used, including:

- making regulations regarding the prohibition, control or maintenance of non-railway works or non-railway operations that are deemed to constitute a threat to safe railway operations (Section 24);
- making formal agreements (MOUs) with the NTAgency concerning the coordination of activities or resolution of conflicting procedures between the RSD and the NTAgency related to railway works and equipment or rail safety in general (Section 6);

- setting, or requiring a railway to set, engineering, maintenance of line works, design, construction, alteration, operation and maintenance-of-way equipment performance standards (Sections 7, 18);
- requiring the railways to keep and preserve railway company information, records and documents relevant to the safety of railway operations (Section 37);
- issuing ministerial orders concerning unauthorized or improperly maintained railway works (Section 32);
- issuing ministerial emergency directives to immediately cease to use or operate (for a period not to exceed six months) railway works or equipment, even if such works or equipment are constructed and operated in accordance with the law in force at the time (Section 33);
- enforcing an order or emergency directive through the federal courts (Section 34);
- pursuing criminal prosecutions, including fines up to \$200,000 per day and terms of imprisonment up to one year (Section 41);
- establishing a Railway Safety Consultative Committee to advise on rail safety matters (Section 44).

In contrast, relatively few powers or instruments provided for by the Act originate with and are used by the railways. The railways have availed themselves of only the first three below:

- The railways may formulate rules on their own initiative and file these rules with the RSD for approval by the Minister (Section 20).
- The railways may apply for a grant for grade crossing improvements (Section 12).
- The railways may apply for a grant for the following: programs aimed at rail safety research or education; projects relating to the design, demonstration or evaluation of railway works or equipment that are deemed likely to promote or contribute to safe railway operations; or the construction of some railway works (Section 14).
- The railways may apply for a grant for the construction of or alterations to grade separations<sup>3</sup> (Section 13).
- In order to prevent the development of a situation that is potentially threatening to safe railway operations, a railway company may enter land adjoining a railway line to remove obstructions to railway works or to maintain or alter railway works<sup>4</sup> (Section 25).



Several points are noteworthy regarding the various regulatory instruments available to the federal government. First, the development and usage of performance standards are just beginning. As an example of a step in the direction of performance standards, the recently introduced Freight Car Safety Standards invoke the industry's own (AAR) Open Top Safety Rules, replacing a detailed CTC order. Second, although no formal order has been issued to the railways requiring them to have, preserve and make available to the federal inspectors specified safety information, RSIs are increasingly perusing railway company safety and maintenance records, made available by the railways on a voluntary basis. So far, however, the federal government has not relied much on railway company inspection, operating and maintenance data and special safety studies. Third, voluntary compliance has been the most effective and inexpensive regulatory instrument of all those used. Fourth, criminal or civil prosecutions, which would be very expensive, have never been used.

## The Consultation Process

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The Committee believes that it was the intent of legislators to build into the railway safety legislative framework consultation as key to the maintenance of relationships between concerned parties and the preservation of a positive working environment in a mature industry. The regulation-making process has an inherent consultation element, and legislators built consultations into the rule-making provisions of the *RS Act*. Provision was also made for a consultative committee to be established under Section 44. The Committee was informed, however, that the consultative committee envisioned under Section 44 has never been established.

The Committee heard numerous concerns from stakeholders, who stated that they have no, or insufficient, opportunity to consult on matters of concern. Others pointed to the fact that the time provided to respond to issues in the rule-making process is not equally allocated among those consulted.

It was also suggested by stakeholders that the membership of the consultative committee, which is specified in detail in Section 44 of the *RS Act*, might not have continuing relevance and should be reviewed.

The Committee believes that the consultative committee could serve the regulator and the industry by informing the Minister of their views on issues not normally addressed in the rule-making process. The input

of a third party could serve to ensure that any safety issues not otherwise dealt with could be heard and resolved.

Another matter of concern was that exemptions to rules can be granted without consultation with concerned parties. Unions consulted

*Increased reliance on the railways to manage their own affairs should be balanced by the responsibility of listening to more feedback from the general public and interested parties on issues of public concern and perceptions of rail safety. The adoption of regulatory instruments such as performance standards, which focus the federal role more heavily on monitoring and, especially, auditing railway safety, and the formulation of government-sponsored rules would make implementation of a robust formal consultation mechanism desirable.*

advised the Committee that they support a form of consultation and believe it should be mandatory. In their view, it is as important to be consulted in an exemption to a rule as in the establishment of that rule. They also agreed with the establishment of a time limit within which views must be made known, provided such a limit is reasonable.

The railways' positions varied greatly, with some supporting the consultation process and others opposing it categorically. Some companies believed that, since exemptions are generally company-specific, no useful purpose would be served by consulting unions. Others believed

that, where the exemption sought is company-specific, consultation should be only with local unions.

That an exemption to a rule may have as important consequences for safety as the establishment of the rule itself makes sense. The absence of a requirement to consult under Section 22 is inconsistent with the principle established in Sections 19 and 20.

If the government is to concentrate its efforts on ensuring public safety while allowing the safety of railway operations to be handled primarily by the railway companies, information dissemination, including the results of safety audits and safety performance, should take on more prominence. Moreover, increased reliance on the railways to manage their own affairs should be balanced by the responsibility of listening to more feedback from the general public and interested parties on issues of public concern and perceptions of rail safety. The adoption of regulatory instruments such as performance standards, which focus the federal role more heavily on monitoring and, especially, auditing railway safety, and the formulation of government-sponsored rules would make implementation of a robust formal consultation mechanism desirable.

## RECOMMENDATION 4.12

We recommend that the Minister of Transport implement the Railway Safety Consultative Committee as specified in Section 44 of the *Railway Safety Act*. We further recommend that the Act be amended to eliminate the specified membership and to permit the Minister to appoint members as required, including representation from railways, unions and public interest groups.

## RECOMMENDATION 4.13

We recommend that Sections 19 and 20 of the *Railway Safety Act* be amended to ensure that all parties are subject to the same time constraints for consultation under the rule-making process.

## RECOMMENDATION 4.14

We recommend that Section 22 of the *Railway Safety Act* be amended to require a consultation process with relevant associations, similar to the process established by Sections 19 and 20, and that a time period be prescribed within which the association consulted may make its views known. We further recommend that the Minister be required to make a decision on an application for an exemption within 30 days of receipt, with provision for one extension of no more than 60 days.

## RAILWAY SAFETY POLICY

It is the view of this Committee that the government should take a leadership role in the field of railway safety. As suggested earlier, that role should focus on elements of public safety, and on monitoring and auditing railway operations.

The Committee recognizes that, in terms of role and legislation, the recommendations it has made are sweeping. Organizational bodies within both railways and government will require time and effort to adapt to their new roles and responsibilities.

It is of concern that there is no specific statement of policy, clearly defining roles and responsibilities, in the *RS Act*. The Committee believes that this should be an essential element of the Act.

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## RECOMMENDATION 4.15

**We recommend that a statement of policy relevant to railway safety, outlining objectives and roles, be included in the *Railway Safety Act*.**

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This policy statement could be similar in nature to that in the *NTA, 1987*. It should be short, clear and understandable, and should set out the basic intentions of the Act.

The Committee proposes the following as an example:

The *RS Act* is intended to ensure a safe, efficient and environmentally sound network of railway transportation, with the railways taking a lead by proposing and implementing operational safety and the regulator approving and monitoring the railways. The regulator shall also be empowered to undertake initiatives to ensure the safety of the public.

The issues dealt with in this chapter represent important aspects of policy and intent in the legislation that comprises the railway safety regime. Much of the Committee's research, which forms the foundation for the various recommendations, was designed to address the issues raised by individuals and organizations with whom meetings were held or from whom submissions were received.

It was not possible, however, to deal extensively with every suggestion for change. A number of organizations and interested parties, including Transport Canada itself, raised issues that merit consideration or, at the very least, further study. Proposals involving substantive amendments to the *RS Act* and other statutes have been or will be addressed in this report. Some of the remaining proposed amendments amount to corrections to or clarifications of the wording of the statute, while others are far more substantive in nature.

Whether the proposed changes are administrative or policy-related, the Committee wants to be certain that they receive proper scrutiny. Just as the Committee's proposed changes will clarify and improve the safety framework, many of the other proposals are designed to improve the efficiency of the Act and the process by which it is enforced.

The Committee has looked at these remaining proposals and has some recommendations to make. These, along with a brief justification, appear in Appendix 1 to the report. They are intended to add clarity and to make the legislation more efficient. Appendix 1 also contains reference to other issues that came to the Committee's attention and that it feels are important. The Committee draws the attention of the appropriate authorities to these recommendations and urges that they be given due consideration.

## NOTES

1. It should be noted, however, that there never was a documented accusation of actual conflict of interest, as pointed out in Transport Institute, University of Manitoba, "Roles of the Railway Safety Directorate in Advancing Rail Safety: Rules and Regulations," Report prepared for the Railway Safety Act Review Committee, August 1994, p. 4.
2. Performance standards and comprehensive safety plans are defined in the Glossary.
3. Funds have not been voted for this provision.
4. This authority was not used in part because the government did not adopt the necessary regulations under Section 24(1)(e).

## THE REGULATOR: ROLES AND RESPONSIBILITIES

*Remnants of the old culture  
remain within both  
the regulator and industry.*



### INTRODUCTION

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In the previous chapter, the Committee spoke to the need for rationalization of the legislative framework for rail safety and discussed what it considers to be the role of government. This chapter reviews the government's current regulatory program and discusses, in more detail, a revised role for the regulator.

The regulator's major roles in railway operational matters under the *Railway Safety Act (RS Act)* are as follows: the regulator is the final decision-maker on regulations or railway-sponsored rules; and the regulator is mandated to conduct compliance and enforcement activities under Sections 28–33 (inspection) and 41 (penalties and prosecution). This chapter will focus on how the government has employed these legislative provisions and examine whether it has been done in accordance with the tenets of the *RS Act*.

An important component of the underlying philosophy of the Act, as the Committee understands it from its research and interviews with the Act's architects, was to foster an industry–regulator relationship in which the railways were to be responsible for, and manage, safety. The government was to reserve for itself the ability to hold the railways accountable for their safety actions, as well as to have a large role in ensuring public and employee safety. For safety areas in which the expertise lay with the industry, the government's role was to establish the broad objectives of safety, while leaving the detailed means of achieving safety objectives with the railways. The focal point, therefore, for the regulator was to be matters of public safety. The role of the industry was to achieve the highest standards of safety, given the resources it had and the goals approved by the regulator.

Has the government fulfilled the role envisaged for it in the *RS Act*? The Committee notes the continuing existence of incongruities between



its understanding of the intentions of the Act and the reality achieved. This is partly because government and industry are still saddled with a body of regulations created prior to the Act — regulations that reflect a century-old culture in which the regulator dominated every detailed facet of railway operational matters. It is unlikely that progress to a more flexible regulatory framework will be possible until these regulations are removed.

## THE REGULATORY PROGRAM

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### Towards Performance-Based Rules

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In a previous chapter, the Committee recommended that the *RS Act* be amended to provide for the setting of safety performance standards through making rules, and proposed a safety program approach based on a broadened rule-making process.

The Railway Safety Directorate (RSD) is much better equipped for speedy action than was the Canadian Transport Commission (CTC), particularly after the introduction of the rule-making process in the Act and subsequent greater administrative flexibility. Rules are approved (under delegation) at the level of the Assistant Deputy Minister (ADM) (Surface). Under the prior regime, the main path for the regulator was through the lengthy and cumbersome enactment of regulations.

The new process has been available to the regulator and the railways since the *RS Act* came into effect, giving them time to become used to a less prescriptive framework based on the railways' production of rules and their submission to the regulator.

While the railways have argued for greater freedom to manage their operations, the perception of how far this has been the case under the *RS Act* differs from the reality. Indeed, although the Act has fostered a more cooperative relationship between the regulator and industry, it is the Committee's judgment that remnants of the old culture remain within both the regulator and industry.

The Committee feels that, operationally, both the railways and the government have failed to fully assume the responsibilities and roles envisaged by the Act's creators. The current system is still a regulator-dominated system.

In the Committee's view, there are still differences between what legislators intended when they framed the *RS Act* and what has actually happened. While both regulator and railways recognize the inherent principles enshrined in the *RS Act*, only marginal progress has been made in five years to give effect to these principles. Algoma Central Railway asserted:

The philosophy that railways have the responsibility to manage has not been fully accepted by either the regulator or the industry even though that view continues to be expressed by both parties . . . Regulatory control continues to be monitored by inspection and we see no evidence that the concept of performance standards and reporting measures are being developed although the notion of monitoring railway safety through safety audits has been proposed by the operators . . . There seems to be little relaxation in either the amount of regulation or the detail associated with it. Some redundant and historic regulations have been cancelled but little has occurred to demonstrate an acceptance of significantly new philosophies or approaches.<sup>1</sup>

The RSD believes that the slowness in implementing performance standards is partly attributable to the railways themselves — and, indeed, Committee consultations revealed that some railway officials would agree with this assessment.

By way of illustration, it is noteworthy that the essence of the *RS Act* — the rule-making process — has been used only five times since 1989. The result is that most of the regulatory framework is still composed of prescriptive, detailed regulations enacted under the old system.

*The regulator's major roles in railway operational matters under the RS Act are as follows: the regulator is the final decision-maker on regulations or railway-sponsored rules; and the regulator is mandated to conduct compliance and enforcement activities under Sections 28–33 (inspection) and 41 (penalties and prosecution).*

The lack of new rules affects the work of the regulator and any efforts at transition. An unwillingness to disturb the status quo and lack of resources would appear to be the greatest impediments to a more flexible and less detailed approach.

It is inherently easier for both the railways and the regulator to retain the roles that they have had in the past than to enter unknown territory by significantly altering their approaches to safety.

Detailed “command and control” statutory instruments spur the regulator, as before, to pursue an end-product compliance method, which has now become inefficient. If performance standards were set, railway safety inspectors (RSIs) would examine the quality of processes used to obey the rule and perform fewer front-line inspections. The Committee sees the elimination of the old prescriptive regulations and the setting of performance standards as necessary steps towards the evolution of a regime that will fulfil the intentions of the *RS Act*.

## Engineering

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**Track** In an attempt at standardization, the regulator has created rules where there were previously none in order to have a means of enforcement. In September 1992, the Minister approved a Canadian version of the Federal Railroad Administration’s (FRA) Track Safety Standards.<sup>2</sup> Prior to this, the regulatory staff had to inspect each company on the basis of their respective internal circulars, which more often were based on higher-level maintenance standards, such as those of the Association of American Railroads (AAR), than on minimal safety requirements.

These rules contain a considerable amount of detailed specification instead of a performance standard, and they may be problematic to Class I railways because of the advanced technology these railways already use to monitor track safety. In the Committee’s view, this use of the rule-making provision of the *RS Act* to institute prescriptive rules instead of a performance standard represents a missed opportunity.

**Signalling and Traffic Control** The area of signalling and traffic control systems is one in which old regulations conflict with the provisions of the *RS Act*.

The *RS Act*, under Sections 8–11, has provided a basic framework that is consistent with the concept that responsibility for the integrity and safety of the system should rest with the railway companies. Consequently, railways no longer need to apply to the regulatory body when making changes to their facilities, as they were required to do under the previous regime. A system of railway certification by affidavit and monitoring programs by the RSD now take the place of the previous process, which involved formal application, inspection, approval and authorization by order.

Regulatory staff, however, are still operating under General Orders E-13 and E-14, which date back to the CTC era.<sup>3</sup> Many clauses in these regulations are outdated or inapplicable. For example, Clause 5 of General Order E-13 requires the submission of drawings and the receipt of approvals before work begins. This conflicts with the tenets of the *RS Act*, since current regulatory requirements should place the responsibility for maintaining and operating a safe system on the railways.

There is clearly a need to eliminate the outdated orders. The Committee would like any rules required in this area to be in the form of railway safety plans addressing performance standards for signalling and traffic control. The RSD could then adopt a role of assisting in the establishment of overall objectives and providing adequate monitoring to ensure public safety.

**Crossings** Crossings represent the main focus of engineering regulatory and inspection efforts. Given the qualitatively variable nature of crossing issues, the government's regulatory approach is addressed in a separate chapter.

## Equipment and Operations

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**Cars** Rules for freight car inspection and safety were revised as recently as October 25, 1994.<sup>4</sup> They still contain detailed specifications of what constitutes a defective car and follow a format similar to the one used before the Act came into effect.

**Locomotives** The main regulatory instruments regarding locomotives still emanate from the previous regime and are highly prescriptive. The Committee notes, however, that RSD staff are presently talking with the railways with a view to consolidating many of these regulations into a railway "Standard Practice Circular" document. This circular could then be used by railway officers and employees responsible for the maintenance and inspection of locomotives. This is a move that reflects the philosophy of the *RS Act* and one that the Committee would encourage. Nonetheless, detailed locomotive regulations (seven in all) remain in effect, and the RSD continues to have a detailed locomotive inspection program — despite the fact that defects in locomotives are rarely a cause of accidents. This program, the Committee hopes, will quickly move away from its prescriptive roots.

**Operations** In the area of operations, the Canadian Rail Operating Rules (CROs) were instituted as a rule under the *RS Act* soon after the Act came into effect. They were developed by the railways after

consultation with labour unions. The Committee sees this as a step in the right direction. Nevertheless, the new CRORs are still detailed, and it would be very difficult to see them as springing from broad performance standards. However, having been made under the rule-making provision of the *RS Act*, the CRORs will be flexible and could be adapted to the new philosophy. RSD safety inspectors currently monitor for compliance with the CRORs.

## The Construction of Railway Works and Affidavits

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The construction and alteration of railway works are subject to the new regulations on notice of railway works and filing of affidavits<sup>5</sup> — a direct result of the processes introduced by Sections 8–11 of the *RS Act*. The Committee considers this to be one of the positive outcomes of the use of the *RS Act* as originally intended. From an engineering perspective, this aspect of the regulatory program has produced significant change. The previous process under the CTC involved close regulatory control and resultant orders. The only requirement now is that notice be given of the intention to carry out certain works. Those whose safety may be affected can register objections before the work is undertaken. This approach under the *RS Act* acknowledges that most railway work either conforms to standard plans or is in line with accepted engineering standards. The new process has freed industry to undertake most projects without encountering much red tape. It has also relieved the RSD of much unproductive routine activity, while effectively placing responsibility for safety on the railways.

The *RS Act* requires that the safety of completed works be certified by a professional engineer in the form of an affidavit, which is provided to the regulator by the party that originally proposed the work. Most participants in Committee consultations, including the railways and the regulator, agreed that the affidavit process places an unnecessary administrative burden on the industry and other affected parties without any proven increase in safety.

The affidavit process appears to be a remnant of the old *Railway Act* culture, in which the regulator reserved to itself the final authority to declare a work safe and would, in fact, give engineering orders to that effect. The Committee believes that a declaration from the person in charge of the work that the work has been completed to original specifications is sufficient.



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## RECOMMENDATION 5.1

**We recommend that the requirement in Section 11 of the *Railway Safety Act* that an affidavit be filed with the Minister by a professional engineer be replaced by a requirement for a letter of declaration by the person in charge of the work on behalf of the party undertaking the work.**

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Such a form of certification would not detract from the RSD's ability to monitor the railways' performance in railway work construction. The RSD requires a "paper trail" for works undertaken so that it can monitor and audit the works' compliance with safety practices. An appropriate monitoring program would, via a sampling approach, analyze trends and perform front-line inspections in problem areas or areas of specific concern. Recommendation 5.1 would streamline the process without jeopardizing safety or the ability of the government to hold railways accountable for the construction of safe works.

## Performance Standards

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Both the railways and the regulator appear to be tentative in moving to implement performance standards. This lack of initiative and the continuing tradition of prescriptive regulations have effectively prevented both groups from creating a framework for the implementation of performance standards.

The continuing practices of both the regulator and industry may not contribute to the implementation of performance standards. For example, senior RSD officers and the railways accepted the fact that lower-level railway employees like the security of "detailed regulation." Railway downsizing may also be playing a role in hindering a rapid progression to performance standards. The difficulties that often accompany corporate change could mean less scope for energy and resources to be devoted to major new initiatives. Committee research suggests that the railways recognize that there is at least some truth to these arguments.



Certain areas of railway safety have lent themselves to the push for performance standards, while others have not. The recent air brake rules were cited by many parties as an appropriate movement to the use of broad objectives, in that the railways must meet braking criteria but may choose the means by which they are met.

The railways told the Committee that the conceptual and practical implementation of performance standards must necessarily evolve over time. They indicated that, internally, it will take time to bring their front-line employees to accept the change in focus that performance standards entail. As well, internal data collection/analysis and technological performance measurements will have to be upgraded over time to allow for the auditing of performance standards/safety plans based on accident and other relevant statistics. These observations apply equally to the regulator.

## Performance Standards in Other Countries

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Performance standards are already used extensively in other nations. In Britain, comparable objectives, stated in terms of the risk of derailments, for example, are used by British Rail and Railtrack. In the United States, some Class I railroads seem to operate on the basis of these overall concepts of performance standards:

Back in 1989, CSXT's [CSX Transportation Inc.] record of employee injuries per 200,000 employee hours worked was a very average 6.61. The numbers have come steadily down, to 3.20 in 1992 and to 2.60 last year. This year, says Executive Vice President and Chief Operating Officer Jerry R. Davis, the target is a further improvement of 20% "and as of now, we're making it." CSXT has set the same 20% improvement targets for reducing derailments and grade crossing collisions.<sup>6</sup>

CSXT is thus establishing a performance standard<sup>7</sup> in a broad sense, which the Committee believes has considerable merit. It wants to see Canadian railways taking a leadership role in setting such objectives in consultation with the government. But, it seems that, until the body of prescriptive regulations is removed, neither the railways nor the regulator will be able to move quickly to implement a framework of rules and compliance based on performance standards.

Performance standards may not always be appropriate in all cases, however. Railways advised the Committee that certain areas, such as crossings, may still benefit from a prescriptive rather than a performance-based approach. There is no point in having a performance standard when it is unclear who has to meet that standard. In these cases, unlike those of railway operations, the Committee believes that the regulator should establish clear rules.

In Britain, there is a similar system to that which the Committee is proposing. It is outlined in the following box.

### Britain's Railway Safety System

- British Rail will be divided into 29 separate operating companies.
- **Railtrack** (government-owned) controls national railway infrastructure.
- **Railway Group** includes, among others, British Rail, Railtrack, other train and station operators.

#### **Guiding Principles** for present structure:

- Any system that emerges must not lead to a reduction in current safety standards.
- Prime responsibility for ensuring safety must rest with the parties that have control (responsibility limited to the extent they actually have control).
- Arrangements must be demonstrably fair to all parties.

**HM Railway Inspectorate** Conducts "preventive" inspections of premises and activities on railways as part of enforcement program, and inspects "new works" (such as stations, new stretches of line, bridges); has power to authorize/accept new rolling stock and locomotives. Inspectorate's safety management practices evolving from a compliance-driven organization to a risk-management organization.

**Infrastructure Controller** Controls Railway Group safety; approves safety cases submitted by operators. Main elements of safety case include, for new operators, information about operation, safety management system and audit, risk assessment and arrangements for emergencies; and, for existing operators, remedial measures proposed, with timetable.

### Britain's Railway Safety System (*continued*)

**Railway Group Safety Plan** Issued by Railtrack; all operators must comply; sets concepts of risk management. In response, operator produces safety plan, with its safety objectives, and reports on previous year's safety performance. To produce Railway Group Safety Plan, Railtrack, train operators and infrastructure zone operators discuss new safety initiatives to be introduced, measure performance against last year's objectives and determine how main safety concerns are being addressed, e.g., risk-based assessment to set safety targets for contractors working for operators. Later, Railtrack drafts objectives, which are presented to Railway Group; areas of contention and costs of achieving objectives are identified. Railtrack has final say on Group Safety Plan. (Inspectorate has no enforcement powers over objectives and must accept Safety Plan.)

**Safety Standards (in Railtrack)** Railtrack manages development of mandatory standards for safety of railway, its customers, contractors, and employees and public. Responsible for signals design, defining required training hours, etc. Moving to performance standards.

**Safety Audits** Conducted to determine whether operators are complying with the safety case and Railway Group standards. Audits now require planning by Railtrack and British Rail, which have an Audit Convention; audits of compliance with safety case and safety validation undertaken on a shared basis by Railtrack and British Rail.

## GOVERNMENTAL ENFORCEMENT AND COMPLIANCE APPROACH

### Overall Strategies

RSD compliance and enforcement strategies are set in broad terms by its Director General and by the functional Directors in their guidance to regional staff. The regions, however, report directly to the ADM (Surface). In this respect, therefore, the effective setter of broad strategies does not have direct control over those responsible for the implementation of those strategies.

The strategic approach of the RSD to enforcement and compliance is not contained in a single policy document. It was indicated to the Committee from the HQ level that the RSD's ultimate goal is to move the organization and its inspectors from their role of end-product inspection to one of monitoring and auditing railway safety systems. In this

context, the role of regional inspectors would be to monitor for compliance and send data back to the RSD. In theory, the central office's primary task is to have appropriate regulations or rules written and to analyze regional data to identify trends for monitoring.

Realizing that organizational change takes time, the RSD, as a first step, has attempted to move away from the most basic of inspection and compliance methods — that is, issuing individual rule violations on a case-by-case basis to be fixed by the railway. Instead, the RSD has encouraged its equipment inspectors to seek to identify larger “sections” within which a pattern of defects can be traced. Subsequently, the railways will be required to correct the systemic problem, at which point the RSIs may do a random sampling to verify compliance.

## Inspection Regime

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Engineering inspections involve inspections of the fixed infrastructure of the railways, such as tracks, railway–road crossings, bridges, and signals and train control systems, which include automatic protection signals at crossings, hot box detectors and interlocking systems. Equipment inspections supervise the safety of motive power units (MPUs) and cars, and the transportation of dangerous goods. Operations inspections are directed primarily at on-board operations, and include such matters as train speed and whistling.

The inspection criteria provided to the RSIs by HQ are fairly general, and the guidance material assumes that the inspectors are experts in their field. While HQ provides broad guidance on how and what to inspect, the actual inspection program is devised by regional Directors. While the RSD may implicitly indicate inspection priorities to each region, the regional application of the suggested priorities varies. In effect, most of the detailed work of selecting targets for inspections and of following up for compliance is done at the discretion of the regions.

Regional RSIs submit reports on defects in individual pieces of equipment, track, bridges, signals, crossings or specific rail company operations that, in their opinion, constitute a safety violation. It is the railways' responsibility to repair or correct defects and, in most instances, they do so voluntarily, giving the RSIs a report indicating that the defects have been corrected. In only a few cases does the defect result in a notice or order.

The RSD receives copies of the reports on defects and prepares computerized summaries and other reports based on these data. These are then sent to the regions to assist in planning.

Inspectors still conduct basic physical inspections of railway works and equipment, and, in the operational field, they inspect for compliance with specific rules. In the past few years, the number of inspections has been relatively constant. In 1993, there were 41,500 inspections of cars and 3,500 of MPUs. The equivalent of 110% of Canada's locomotives and 37% of the cars were inspected by the equipment branch. The Canadian railway system has 44,000 miles of track, of which 13,400 miles (and 23% of the 48,000 public and private grade crossings) were inspected by engineering RSIs in 1993–1994. Operations RSIs rode 90,000 miles in locomotive cabs. There is no indication of dramatic evolution in the regulator's compliance approach. The inspection efforts are summarized in Table 5.1.<sup>8</sup>

<b>Table 5.1</b> <b>SUMMARY RESULTS OF INSPECTION REPORTS</b>					
Type of monitoring activity (branch)	No. of inspections	No. of defects/ violations identified	No. of safety defects identified	Defects/ units inspected (%)	Safety defects/ units inspected (%)
<b>Engineering (1993–1994)*</b>					
1. Crossings (public and private)	12,322	2,799	N/A**	22.72	N/A
2. Track (miles)	13,415	3,624	N/A	27.01	N/A
3. Bridges	1,108	107	N/A	9.66	N/A
4. Train control and signals	985	800	N/A	81.22	N/A
<b>Equipment (1993)</b>					
5. Cars	41,487	7,749	2,413	18.68	5.82
6. MPUs	3,482	8,786	738	252.32	21.19
<b>Operations (1993)</b>					
7. RSI train miles	90,272	2,381	N/A	2.64	N/A

*Notes:*

\* Fiscal year.

\*\* N/A = not applicable.

Source: Lykos International Inc., J. Dion, N.R.J. Gwyn, G.R. Heinmiller, "Inspections and Compliance Measures of the Rail Safety Program of Transport Canada," Report prepared for the Railway Safety Act Review Committee, October 1994, p. 10.

These numbers reveal little about how much safety in the overall railway system is enhanced by the RSD. In Committee consultations, the railways indicated that inspectors serve as a good “second pair of eyes”; however, this does not establish that all the money and effort invested in physical inspections of railway works have a beneficial effect.

## Compliance Measures

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Under the *RS Act*, the RSD has the statutory power to issue notices and orders. When RSIs believe that an immediate safety threat is present, they may issue a notice or order under Section 31 of the *RS Act*. In effect, however, most inspectors seek to elicit compliance voluntarily, without resorting to the more serious step of invoking their formal powers. Strategically, this has worked out well. The voluntary compliance approach adopted as the basis for the strategy of the RSD is more effective than dealing with non-compliance primarily through prosecution, and it should not be changed as long as inspections constitute the RSIs' principal activity.

However, when voluntary compliance fails, inspectors are not averse to utilizing the notice and order process. Very few notices and orders are issued overall: they have ranged from 32 to 34 a year over the last few years, and most have concerned crossing sightlines. To date, the RSD has not used Section 41, in which the railways can be prosecuted and fined for failure to comply with the Act, regulations and rules, an emergency directive from the Minister or an order from an inspector. In effect, the RSD does not believe that the use of Section 41 is an appropriate avenue for safety enhancement. Voluntary compliance and the threat of invoking Section 31 are a more useful means, largely because they immediately address the need for safety corrections.

## Movements Towards Monitoring, Auditing and Data Usage

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A movement towards monitoring and auditing, as noted, was to be a key strategy of the RSD under the Act. In a briefing to its equipment inspectors in June 1994,<sup>9</sup> for example, the RSD acknowledged that monitoring of railway equipment should not be based merely on routine inspections; greater emphasis was to be placed on identifying problem areas and reviewing internal records. While the Committee welcomes any movement away from a rigid inspection program, such strategies represent only a first step. Some progress has been made by the regulator towards a more process-oriented compliance regime. For example,





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the Ontario Region Track Engineering Branch now uses a five-year inspection program, developed at HQ, that calls for a paper audit of log books; a review of track geometry car data (on a selective basis); a review of rail defect data; and consideration of speed restrictions, which give a general indication of track condition. These data help identify areas for inspections and priority defects. The Committee recognizes that this represents an improvement, but there is still inconsistency across Canada in terms of implementing more modern inspection strategies.

In the previous chapter, the Committee recommended that the most efficient means of enforcement would be for the RSD to conduct audits of railway processes. This would require a base of useful data that is regularly updated and the capacity of RSD people to subject it to trend analysis. Data utilization, however, currently plays a limited role in the overall inspection and compliance approach of the regulator. Few data are routinely supplied to the RSD by the railways or, in fact, requested by the regulator. The RSD apparently does not compare RSI findings with those from railway monitoring.

The present rail safety inspection database is of limited use for statistical comparisons of the actual safety inherent in various railways' operations, equipment and infrastructure. The amount of regional variation in the inspection results raises questions about the validity or meaningfulness of the database. More importantly, the manner in which the inspection data are collected, while relatively non-disruptive to railway operations, indicates that it is primarily a policing activity and not one designed to provide a valid sample of the safety of the rail system's components.

It is evident that a new approach will require new components, and the availability of data from railways will be a critical element of this new approach, as will the collection, analysis and strategic use of the data on the part of the regulator.

## Data Availability and New Requirements

Committee research uncovered numerous difficulties in the current system of data collection for both railway operational matters and grade crossing accidents. Data collected by the Transportation Safety Board of Canada (TSBC) have been proven qualitatively inconsistent over the years. For example, in the TSBC database (RAPIDS), the cause of or contributing factor to an accident is often left blank. The type of equipment involved in accidents is similarly given inconsistent treatment when entered in the database. Added to the changed reporting requirements of 1992 (and, prior to that, 1989) and numerous changes in emphasis in reporting details,<sup>10</sup> these factors render the determination of

*Implementation of the new role of the regulator in railway operations and crossings is rooted in the availability of a solid and useable database. True progress in both safety areas will remain elusive until the collection and use of data are customized to allow causal trend analysis of accidents.*

trends difficult, if not virtually impossible. Overall, the data regime does not permit adequate trend analysis.

Crossing accident data generation is also poor. The Committee found that the determination of accident rates does not take into consideration the volume of road and rail traffic, effectively excluding the potential measure of risk at crossings. Neither TSBC reports nor Transport Canada Traffic Accident Information Database (TRAID) data accurately reflect the causes of and contributing factors to crossing accidents. The TSBC tends to collect data from a rail perspective, placing less emphasis on driver behaviour, even though driver inattention is at the root of many accidents. This, too, has hampered efforts to document the major variables involved and hindered subsequent strategies to combat the problem.

Currently, the data available to the RSD from either the TSBC or the railways will not permit an effective transition to the proposed monitoring and auditing role of the regulator. In order to implement this safety program model and a modified function for the RSD, the data generated will have to be significantly upgraded and better utilized by the regulator.

## Changes to the Data Collection Regime

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The regulator will require suitable reporting of, and access to, safety data to ensure that it has the proper information to assess the safety performance and processes of the railways and to determine trends. In this respect, each safety program will have to be backed up by safety-related data, recorded and retained by the company and made available to the government.

Implementation of the new role of the regulator in railway operations and crossings is rooted in the availability of a solid and useable database. True progress in both safety areas will remain elusive until the collection and use of data are customized to allow causal trend analysis of accidents.

The RSD will have to determine, in conjunction with the appropriate federal agencies, railways and provincial highway authorities, what kind of data it will need to fulfil its role as the leader in public safety issues. Among these parties, a national standard for railway safety data and the division of responsibility for data collection will have to be determined, as well as formal arrangements for the mutual sharing of information in a useable format. In this way, each organization connected with railway safety will benefit from all the data generated on railway safety.

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### RECOMMENDATION 5.2

**We recommend that the regulator, in conjunction with railways, provinces and other relevant parties, perform an analysis of data requirements and availability to fulfil its role as a monitoring and auditing agency and to implement means to collect and analyze the required data.**

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## CONCLUSIONS

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At present, the regulatory framework is highly specific and is enforced by detailed physical inspections. This should not continue. As the railways take over the responsibility of proposing and implementing performance standards and safety plans, the RSD must learn to become a less "hands-on" organization in its inspection activities and allow the railways to manage their operations.

It is doubtful whether the inspection program employed by the RSD will change unless the prescriptive body of regulations, upon which such inspection activities are founded, changes as well. With a body of detailed regulations at hand, inspectors will seek the security of inspecting for compliance, as they have done in the past. Changing the regulatory framework to one based on performance standards will no doubt cause a degree of uncertainty and a period of transition in inspection and enforcement activity. What the safety program will do is get the RSIs to focus on examining how the railways manage safety as set out in their approved safety programs.

No doubt, there are some practical benefits to be realized from the type of individual inspections currently conducted by the RSIs. Finding a defect and telling the railways what to do to fix it is safety-enhancing. However, this approach has its limitations in that the railways already have sophisticated programs, trained personnel and machinery to do physical inspections. Hence, much of what the RSIs do may be duplicative.

The Committee feels that safety could be more efficiently enhanced if the RSD were to examine and treat not the defect itself (the end result), but the underlying causes — be they organizational or human — that allowed the safety defect to manifest itself in the first place. The railways believe that they would benefit more — and their safety record would not suffer — if the current means of inspection were replaced by an auditing approach.

The continuation of an end-product approach to compliance is not solely the responsibility of the RSIs. Their clients, the railways, have always expected such types of inspection, and the railway culture is still used to them. The RSD and the railways will have to work in concert to rid their organizations of the culture-rooted impediments to the approach proposed in this report.

There will be some links to the previous system in that the RSD will have to maintain a continuing as well as an enhanced expertise to ensure that both performance standards and safety programs contain compatible basic standards.

In the previous chapter, the Committee recommended an approach in which the railways, using the rule-making process, would be required to submit a safety program to the regulator. This program, which would have to demonstrate how the performance standards established by industry and government would be met by the railways, would be able to accommodate the specific operating circumstances of a particular railway.

The inspection and compliance regime envisioned would evolve in line with this program approach. The current means of inspection in accordance with the details of national regulations and rules applying to all federal railways must be replaced. The uniform regulations and rules that characterize this regime and to which each railway is required to adhere would be replaced by a scheme in which individual railways would choose an appropriate means to safety. This would require the regulator to change its inspection approach to one of monitoring and auditing the mechanisms that the railways have in place to achieve safety objectives.

The evolution to a monitoring and auditing function on the part of the regulator must be complete. To this end, the Committee suggests that the RSD either transform itself into an organization that would meet recognized management standards or arrange for railway audits to be performed by an organization accredited under a program such as the International Organization for Standardization (ISO), so that standards, training and bonding would be provided for the auditors/inspectors. The RSD's program would be threefold: the monitoring of key safety statistics; the performance of audits; and the conduct of a more limited, strategically directed inspection program.

The railway industry, unions and other stakeholders should have a consultative role in this reformation of the regulator.

Formal compliance mechanisms would not have to change. Each company's program is subject to the notice and order process of Section 31 and the provisions for offences of Section 41. The failure of a company to comply with its own program or meet specified standards could result in an order under Section 31, with potential economic



consequences. The option for prosecution under Section 41 would still exist. Overall, the government would retain the authority to hold the railways accountable. The philosophy underlying the *RS Act* is, and should continue to be, that voluntary compliance should be used to the greatest extent possible to ensure rail safety.

If the RSD's monitoring and analysis activities were to be greatly increased and front-line inspection decreased, the staff of the RSD and regional RSIs could be re-allocated to activities more effective and safety-enhancing than those of the present. The regulator would have to be adaptable in order to be able to perform monitoring and to analyze the vast amount of data that are and will be available from the railways' own records and inspections, as well as their mechanically generated data. However, the regulator would still need to maintain the capacity to conduct limited front-line inspections.

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### RECOMMENDATION 5.3

We recommend that the regulator implement a nationally coordinated program of monitoring, auditing and inspection to hold railways accountable for their safety plans. We further recommend that the current emphasis on front-line inspection be replaced by monitoring of key safety indicators, adherence to a multi-year comprehensive audit plan and the strategic use of limited front-line inspection.

### RECOMMENDATION 5.4

We recommend that railways and the regulator work together to establish key indicators and the requisite data streams, as well as an optimal approach to conducting comprehensive audits of the railways' safety plans.

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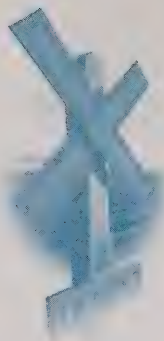


## NOTES

1. Submission of the Algoma Central Railway to the Railway Safety Act Review Committee, May 19, 1994, p. 3.
2. *Railway Track Safety Rules*, October 5, 1992.
3. Canadian Transport Commission, General Order No. E-13 (*Railway Interlocking Systems Regulations*), effective March 1, 1955, and General Order No. E-14 (*Railway Signal and Traffic Control Systems Regulations*), effective February 18, 1955.
4. Railway Freight Car Inspection Rules, approved by the Minister of Transport, October 25, 1994.
5. *Notice of Railway Works Regulations, SOR/91-103* and *Railway Works Filing of Affidavits Regulations, SOR/91-102*, *Canada Gazette*, Part II, Vol. 125(3), January 30, 1991.
6. G. Welty, "What Re-engineering Is Really All About," *Railway Age* (May 1994), p. 37.
7. See the Glossary for information regarding performance standards.
8. Lykos International Inc., J. Dion, N.R.J. Gwyn, G.R. Heinmiller, "Inspections and Compliance Measures of the Rail Safety Program of Transport Canada," Report prepared for the Railway Safety Act Review Committee, October 1994, p. 10.
9. Railway Safety Directorate, Equipment Branch, "Compliance and Surveillance Strategy" (June 1994), distributed at the Branch's annual workshop.
10. For details on reporting changes, see TSBC, "Summary of Railway Accidents/Incidents" (November 1994).

## PEOPLE, ROADS AND RAILWAYS

*Ninety-six percent of all related fatalities occurred at grade crossings or as a result of trespassing.*



### INTRODUCTION

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*Introduction*

It appears that people will suffer injury or death at rail crossings in spite of every possible precaution taken by governments and railways. In Canada, there are approximately 60 deaths at crossings each year and another 60 as a result of trespassing. By contrast, the injury and fatality rates for railway employees are relatively low. In this chapter, the Committee's focus is on the general public.

The Committee examined data covering a five-year period during which over 53% of all "rail" accidents (as defined by the Canadian Transportation Accident Investigation and Safety Board (TSBC)) and 96% of all related fatalities occurred at grade crossings or as a result of trespassing. Although the number of accidents and deaths decreased during the 1980s, the numbers have remained more or less constant in the period since the late 1980s. This also appears to be the case in most developed countries. The *Railway Safety Act (RS Act)* does not appear to have influenced the situation.

In this chapter, data on the circumstances and causes of crossing and trespassing accidents are reviewed. The roles of different levels of government, pressures to silence train whistles and new technologies to improve safety are considered, as is grade crossing risk management in other countries. The Committee has a number of recommendations it believes will help reduce the number of accidents.

### GRADE CROSSINGS: NUMBER AND LOCATION

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*Grade Crossings*

There are 23,500 public crossings under the responsibility of the Railway Safety Directorate (RSD) and 2,900 grade separations. Some 7,300 crossings have a form of automated signal device to warn motorists of a train, and the other 16,200 have some form of static or "passive"

warning. Only 1,400 crossings (of the 7,300) have gates and these cover only two quadrants.<sup>1</sup>

The most effective way of preventing a road-rail crossing accident is never to have the users meet. A four-quadrant gate (there are almost none in Canada) with flashing lights and bells (FLB) would impede vehicle entry more effectively.

Two-quadrant gates with flashing lights and bells are the next most effective equipment in Canada. Their cost ranges from \$80,000 to \$250,000. There are only 1,400 crossings with flashing lights, bells and gates (FLBGs) in Canada. Additionally, 5,830 crossings have FLBs but no gates, and their cost ranges from \$40,000 to \$150,000.<sup>2</sup>

As illustrated in Table 6.1, the ratios of passive to automated crossing protection types differ between the West and the rest of Canada. For example, the Prairies have a preponderance of passive protection systems. Although there may be a relationship between the type of protection and accidents, the data do not conclusively support the case for more automated protection.

<b>Table 6.1</b> <b>FEDERALLY REGULATED PUBLIC CROSSINGS,</b> <b>BY PROVINCE/TERRITORY, 1994</b>			
<b>Province/ territory</b>	<b>Passive protection</b>	<b>Automated protection</b>	<b>Total accidents, 1989-1993 (%, rounded)</b>
N.W.T.	15 (94%)	1 (6%)	—
Yukon	12 (67%)	6 (33%)	—
British Columbia	605 (57%)	458 (43%)	10
Alberta	3,034 (80%)	745 (20%)	16
Saskatchewan	5,984 (92%)	513 (8%)	12
Manitoba	2,659 (84%)	492 (16%)	9
Ontario	2,609 (48%)	2,879 (52%)	32
Quebec	884 (34%)	1,680 (66%)	17
New Brunswick	237 (45%)	287 (55%)	3
Nova Scotia	139 (35%)	256 (65%)	2
Newfoundland	—	1	—

Source: TSBC statistical summaries, cited in W. Knott, "Railway Safety Directorate Funding Actions," Report prepared for the Railway Safety Act Review Committee, August 1994, p. 10.

## Crossing Protection: Types

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The National Transportation Agency (NTAgency) lists four types of crossing in its maintenance and construction cost schedule:<sup>3</sup>

Type 1 — Crossed warning systems (with 24-hour attendant availability).

Type 2 — Crossed warning systems with gates.

Type 3 — Crossed warning systems without gates.

Type 4 — Reflectorized crossing signboards (passive warning).

System components range from the passive warning reflector board to fully automated, synchronized, flashing cantilevered lights and bells, and gates with constant warning time devices.

Types of crossing protection vary, and Transport Canada is in the process of issuing a Grade Crossing Manual delineating standards to be achieved by rail and road authorities. The guideline is in draft form and is generally observed.

The Committee found no Canadian evaluation of the relative effectiveness of various preventive devices. British data suggest that gates are 20 times as effective at preventing accidents as crossings without gates. U.S. data are less conclusive.<sup>4</sup>

## GRADE CROSSING ACCIDENTS

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The overall number of crossing accidents has been declining since 1987, a trend similar to that in other countries (see Figure 6.1). The number of fatalities, however, has remained relatively constant.

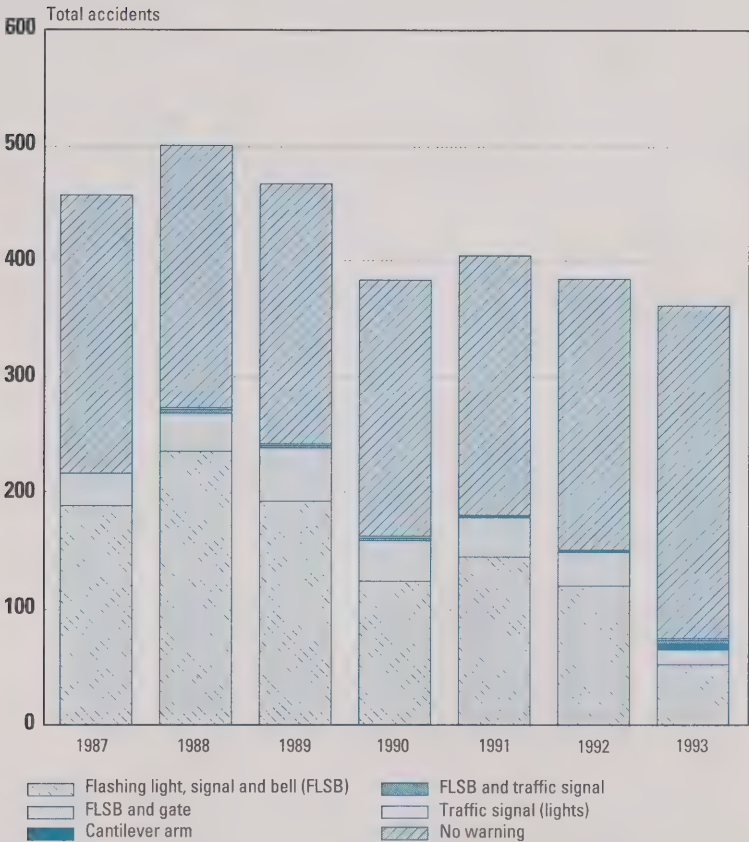
It would be inaccurate to identify one type of crossing as particularly safe or unsafe without accounting for traffic volume, among other factors.

## Causes of Grade Crossing Accidents

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The TSBC defines a railway grade crossing accident as one “wherein any unit of rolling stock on the rails strikes or is struck by a user of a public, private or farm crossing and damage or injury results.”<sup>5</sup>

**Figure 6.1**  
**NUMBER OF CROSSING ACCIDENTS**  
 All types



Source: IBI Group, "The State of Railway Safety in Canada," Report prepared for the Railway Safety Act Review Committee, September 1994, Exhibit 4.16.

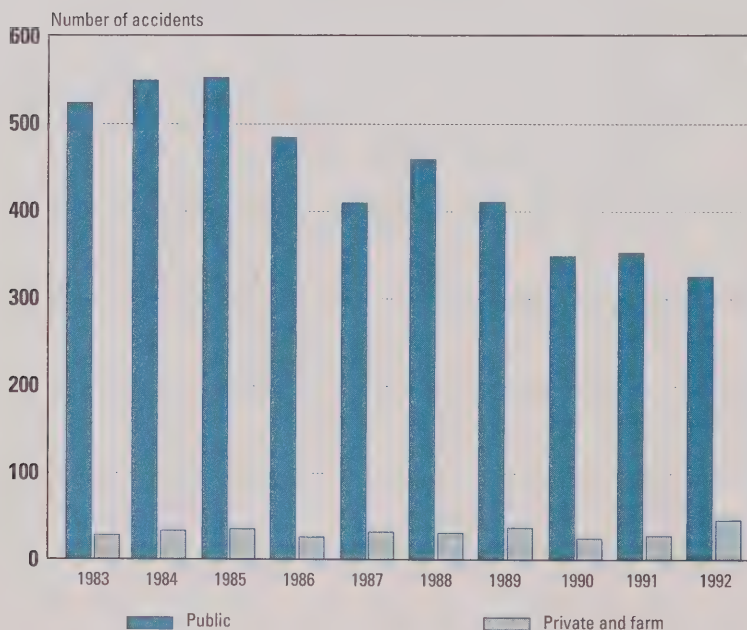
The TSBC collects and processes data pertaining to all reportable rail occurrences in Canada.<sup>6</sup> The data are used to analyze trends with respect to, for example, the frequency and severity of the occurrences over the years. Using these data, the Committee analyzed accident trends for the years 1984–1992, to span the pre- and post-*RS Act* period.

Most accidents occur at public crossings — a number far greater than those at private and farm crossings combined (Figure 6.2). From the early 1980s, there was a downward trend in the frequency of accidents at public crossings, with a levelling off around 1990. This is likely attributable to technological improvements and preventive actions, both of which are discussed in other chapters.

## Causal Indicators in the Data

Data from both the TSBC and Transport Canada (Traffic Accident Information Database (TRAID)) show a decline in vehicle accidents from 1988 to 1990, and a small rise that levels off from 1991 to the present. Although the absolute numbers differ somewhat between the two sources, both show a general decrease from 1983 to 1993 (except for 1988) for all types of vehicles.

**Figure 6.2**  
**NUMBER OF GRADE CROSSING ACCIDENTS**  
By type of crossing



Source: Hickling Corporation, "Grade Crossing Issues," Report prepared for the Railway Safety Act Review Committee, July 1994, p. 10.



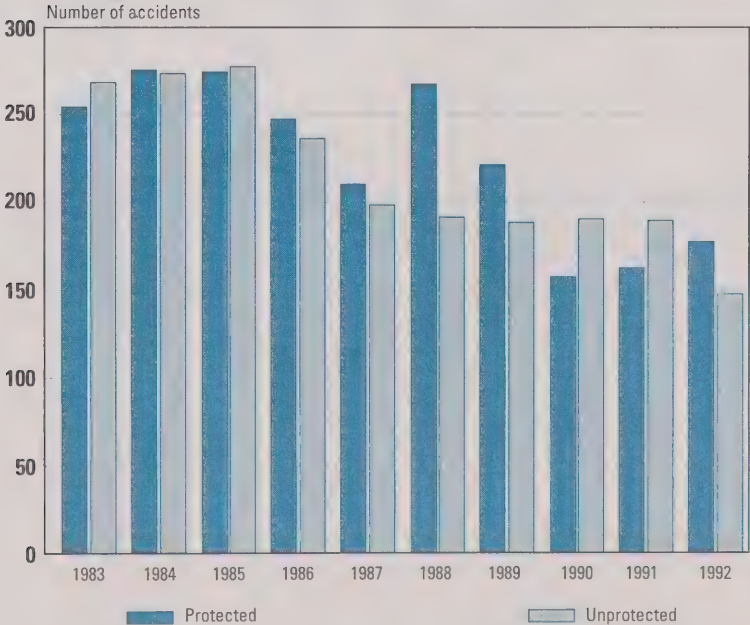
Accidents at protected and unprotected public crossings are presented in Figure 6.3. Except for a similar upward blip in 1988, the downward trend appears to be maintained. The number of public crossing accidents should be considered in relation to the type of protection in place — for example, FLBs or FLBGs.

Data on the TSBC-assigned cause for grade crossing accidents show that driver-caused accidents are by far the most numerous — 80%. Railway-caused accidents represented only 1% of the total (Figure 6.4). No cause was recorded for the remaining 19%.

The TSBC data suggest that:

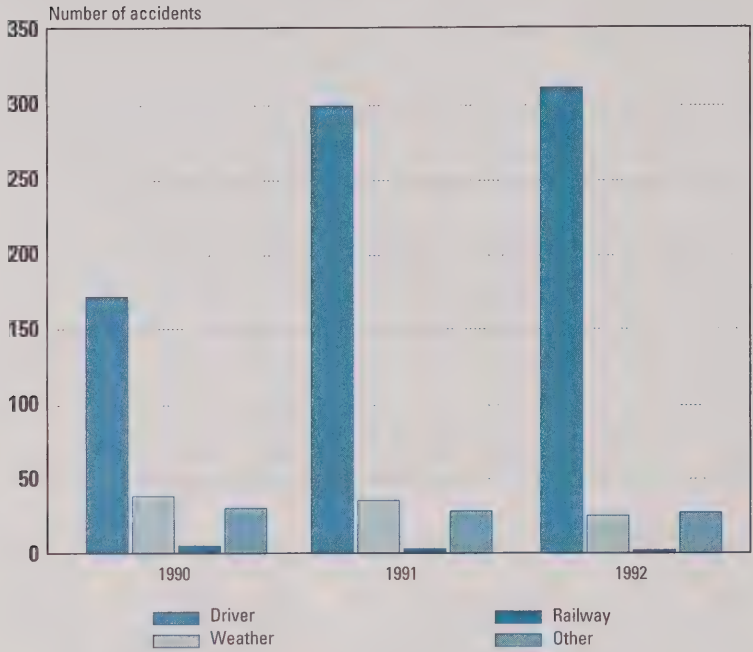
- i. the trend in accidents was downward over the period 1985–1987, with approximate stabilization thereafter (except for the upward blip of 1988);

**Figure 6.3**  
**NUMBER OF ACCIDENTS AT PROTECTED AND UNPROTECTED CROSSINGS**



Source: Hickling Corporation, "Grade Crossing Issues," Report prepared for the Railway Safety Act Review Committee, July 1994, p. 14.

**Figure 6.4**  
**NUMBER OF ACCIDENTS**  
By contributing factor

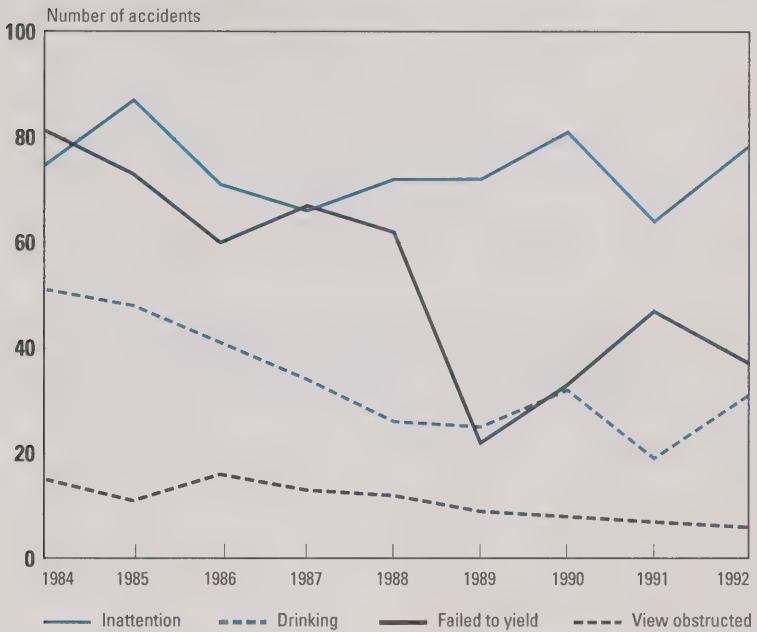


Source: Hickling Corporation, "Grade Crossing Issues," Report prepared for the Railway Safety Act Review Committee, July 1994, p. 15.

- ii. the level of accidents at private and farm crossings has shown no improvement; and
- iii. causes indicate a need for a continued focus on driver behaviour to reduce accidents.

An analysis of these data suggests that the most significant cause of accidents is vehicle drivers. As shown in Figure 6.5 and Table 6.2, the major factors measured are "inattention," "drinking," "failure to yield" and "obstructed view." Among these, "inattention" remains important, and "drinking" appears to have levelled off after declining steadily from 1984. "View obstructed," however, has declined steadily as a contributing factor since 1986. The Committee believes this trend to be related to the application of policies under the *RS Act* with respect to sightlines at grade crossings. Where multiple factors are listed, view obstruction is the primary factor in only a small number of accidents.

**Figure 6.5**  
**FACTORS IN GRADE CROSSING ACCIDENTS, BY YEAR (TRAID)**



Source: Hickling Corporation, "Grade Crossing Issues," Report prepared for the Railway Safety Act Review Committee, July 1994, p. 39.

**Table 6.2**  
**SUMMARY OF CONTRIBUTING FACTORS AND CAUSES**

Contributing factor	Trend description	Possible cause
Drinking involvement	General reduction over the period 1984–1989	General anti-drinking and driving campaigns
Failed to yield	General reduction over the period 1984–1992	Operation Lifesaver education campaign
View obstructed	Small but steady downward trend after 1986	<i>RS Act</i> and CTC/NTAgency policies

Source: Hickling Corporation, "Grade Crossing Issues," Report prepared for the Railway Safety Act Review Committee, July 1994, p. 40.

## Case Study Review

The Committee examined the details of 10 TSBC accident investigation files. Table 6.3 summarizes the findings, which suggest that:

- i. many factors in a small number of cases precluded identification of specific trends;
- ii. FLBs did not seem to attract the motorists' attention;
- iii. human behaviour appears to be the root cause of most accidents; and
- iv. some grade crossing accidents are not preventable, given driver fallibility.

<b>Table 6.3</b> <b>SUMMARY OF SELECTED TSBC CASE CHARACTERISTICS</b>			
<b>Protection</b>	<b>Motorists involved</b>	<b>Motorist behaviour</b>	<b>Factors involved</b>
FLBG	<ul style="list-style-type: none"> <li>• Truck driver</li> <li>• Unlicensed, alcohol-impaired driver</li> </ul>	<ul style="list-style-type: none"> <li>• Abandoned truck when realized collision imminent</li> <li>• Preoccupied; drove through gates</li> </ul>	<ul style="list-style-type: none"> <li>• Snow-covered, icy road</li> <li>• Poor sightlines</li> </ul>
FLBW	<ul style="list-style-type: none"> <li>• Truck driver with 27 yrs experience</li> <li>• Young cyclist</li> </ul>	<ul style="list-style-type: none"> <li>• Did not appear to recognize train's approach</li> <li>• Stopped, or tried to, too late</li> </ul>	<ul style="list-style-type: none"> <li>• Air conditioning on, windows up</li> <li>• 10 prior accidents at same crossing</li> </ul>
Private	<ul style="list-style-type: none"> <li>• Familiar with area</li> </ul>	<ul style="list-style-type: none"> <li>• Stopped in private driveway on track; tried to back up</li> </ul>	<ul style="list-style-type: none"> <li>• Emergency brake applied by locomotive engineer</li> </ul>
SRCS/ Stop & W	<ul style="list-style-type: none"> <li>• Alcohol-/drug-impaired driver</li> <li>• Elderly driver; knew area</li> </ul>	<ul style="list-style-type: none"> <li>• Failed to stop at stop sign</li> </ul>	<ul style="list-style-type: none"> <li>• Poor sightlines</li> <li>• 3 prior accidents since 1965</li> </ul>

*Notes:*

FLBG = flashing lights, bells, gates

FLBW = flashing lights, bells, whistles

SRCS/Stop & W = standard reflectorized crossing sign/stop sign and whistle

*Source:* Hickling Corporation, "Grade Crossing Issues," Report prepared for the Railway Safety Act Review Committee, July 1994, pp. 43–44.

## Conclusions

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- Accidents attributable to poor road sightlines have continued to decline since the mid-1980s.
- Driver inattention may be the major cause of crossing accidents. We should recognize, however, that drivers only rarely encounter a train at a crossing and infrequently have to respond to flashing red lights, wherever located. We should acknowledge that unsuitable siting of warning lights can contribute to driver confusion or provide inadequate warning for an average driver.
- Too little attention (and funding) has been given in Canada to research into grade crossing issues. TSBC and Transport Canada data, being derived only from accident investigations, are insufficient. More information is needed about driver behaviour at crossings when no accident occurs and no train is involved. What difference does it make to driver behaviour to have the windows up, blowing snow and/or the radio, tape or CD playing? To the Committee's knowledge, such matters have not been researched.
- Road traffic signals are a normal part of a driver's experience. The Committee believes that more research is required regarding the effectiveness of traffic lights at rail crossings in Canada.

## THE REGULATOR'S ACTIONS

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The purpose of this part of Chapter 6 is to examine what funds the federal government makes available for grade crossings and related public safety purposes and how, when, where and why it does so.

In this eighty-sixth year of government investment in rail safety, total planned spending under the *RS Act* is \$18,642,000.<sup>7</sup> The funding is expected to

... enhance railway safety by lowering the number of safety-related deficiencies of railway equipment and infrastructure; reduce (the) risk of accidents and deaths related to rail transportation particularly at rail level crossings and trespass locations ...<sup>8</sup>

## Grade Separations

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From the beginning of its intervention in road-rail safety, Ottawa poured millions of dollars into bridge building and underpass construction as a means of controlling accidents. Bridge costs for modern road traffic

needs, however, are in the millions, not thousands, of dollars. Ironically, the year the *RS Act* was promulgated, a decision was made to stop funding grade separations, and Transport Canada began winding down its commitments.

This is reflected in the following:

#### GRADE SEPARATIONS: "ACTUAL" SPENDING<sup>9</sup>

1987–1988	\$7,073,000
1988–1989	\$7,626,000
(1989 Government "stop" decision)	
1989–1990	\$9,061,000
1990–1991	\$6,170,000
1991–1992	\$2,841,000
1992–1993	\$ 400,000
	(Final expenditure)

With the end of the program, bridge and underpass building was greatly reduced. It has since been revived to some degree in the context of the government's infrastructure program.

### Education and Research

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#### Summary

Amounts between \$60,000 and \$80,000 are set aside annually by the RSD, as authorized by Section 14 of the *RS Act*, for education, research, innovation in design, construction or evaluation of a "... work ... likely to promote, or make a contribution to, safe railway operations ... " (Section 14(1)(c)).

In addition, regular grants are made to the Railway Association of Canada's (RAC) program, Operation Lifesaver. An education program aimed at younger people, it is credited with reducing youth–train incidents, and it functions across Canada with the cooperation of provinces and local safety councils.

### Operation Lifesaver

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#### Summary

The annual number of grade crossing accidents in Canada declined considerably from 1979 to 1988. Some of the credit should go to Operation Lifesaver, established in 1981 by the railway companies, the Railway Transport Committee of the former Canadian Transport



Commission (CTC), and provincial and municipal governments. Its purpose was to address the significant number of crossing accidents that result in death, injuries and damage to property. Operation Lifesaver has expanded its scope to include trespassing. It is now sponsored by the RAC and Transport Canada. The RSD is now the federal link to the program, which in 1994–1995 will receive \$82,500 in federal funding.

“Lifesaver” is national in scope to ensure that all regions receive the same complete and up-to-date information. Representatives of Operation Lifesaver (Canada) attend the national meetings of the U.S. Operation Lifesaver (begun in 1972), and share information, films and other educational material.

A 1990 independent evaluation of Operation Lifesaver found that between 750,000 and 1,000,000 people had been exposed to the program’s message during 1988, and that “Lifesaver” had contributed to an overall reduction in crossing accidents.<sup>10</sup>

The effectiveness of Operation Lifesaver even with the relatively modest expenditures allocated for educational purposes leads the Committee to conclude that this area has traditionally not been accorded a high enough priority. It believes that the positive payoff warrants consideration of a greater focus on educational programs.

The Committee finds it noteworthy that new drivers, many of whom have likely taken a driver-training course, are involved in fewer accidents at grade crossings than drivers with many more years of road experience. The data in Figure 6.6 illustrate this and underscore the importance of preventive driver education/training in reducing accidents and, consequently, fatalities.

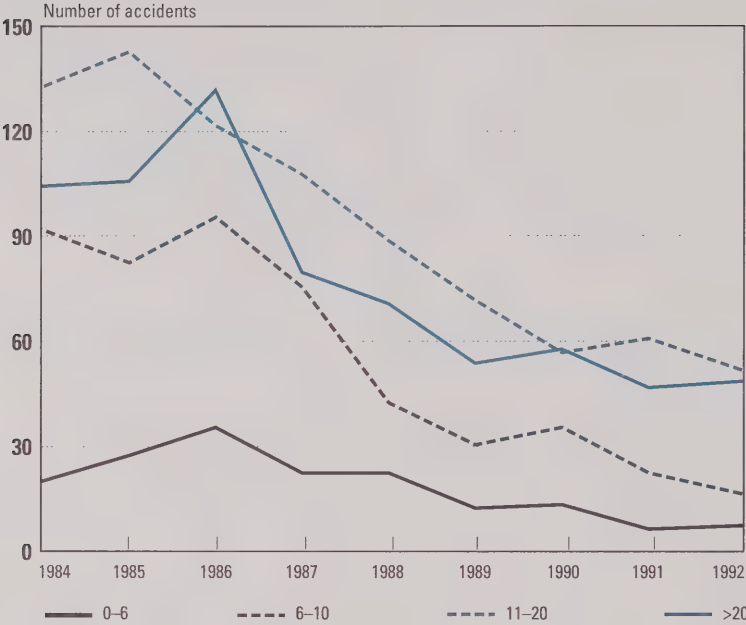
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## RECOMMENDATION 6.1

**We recommend that Transport Canada place higher priority on prevention/education activities as they relate to grade crossings and that a more appropriate proportion of resources be directed to such programs.**

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**Figure 6.6**  
**NUMBER OF GRADE CROSSING ACCIDENTS**  
By years of driving experience



Source: Hickling Corporation, "Grade Crossing Issues," Report prepared for the Railway Safety Act Review Committee, July 1994, p. 29.

## THE GRADE CROSSING IMPROVEMENT PROGRAM (GCIP)

Grade crossings are the intersections of rail lines and roads of any size at grade — that is, when both are on the same level. A crossing may range from a pedestrian path to a multi-lane highway. It can intersect one rail line used twice weekly or a rail complex used hourly.

### The GCIP Stakeholders

Three sets of organizations are involved with grade crossings, relating, in various degrees, to responsibility, finance and maintenance: the regulator(s), the owners of the tracks and the owners of the roads.

**The Regulator** The RSD has responsibility for grade crossings for federally regulated railways. Thirty-five of the 85 railway safety inspectors (RSIs) specialize in crossing design, inspection and assessment, allocating 60% of their time to this activity. Including capital spending on the GCIP, total expenditures on grade crossings account for more than 50% of Transport Canada's allocations to *RS Act* matters.

**The Railways** CN and CP, which are Class I railways, and several smaller provincially situated rail companies are federally regulated. VIA, the other Class I railway, is federally regulated, but owns only a small percentage of the trackage over which it operates.

**The Road Authorities** Grade crossing responsibility partly rests with the relevant municipality or the provincial road authority. Highway design, construction and maintenance affect vehicle safety at crossings.

## Responsibility for Financing Improvements

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The federal government has made money available for grade crossing improvements since 1909, when federal funding covered 20% of the costs. Today, the *RS Act* permits such grants to cover as much as 80% of those costs. The actual available funding fluctuates from year to year, depending on circumstances. For example, when grade separations became the focus of attention in the 1970s and 1980s, less funding became available for grade crossing improvements. The Committee noted that many grade crossing improvements could be financed for the cost of one grade separation, with corresponding safety benefits.

Under guidance from the NTA Agency, funding is routinely agreed to by railways and road authorities on the informal understanding that they will pay 7.5% and 12.5% respectively.<sup>11</sup> The federal taxpayer pays the bulk of the cost, and subsequent maintenance costs are shared equally by rail and road owners. No federal funding is allocated to improvements at Canada's approximately 25,000 private and farm crossings.

Most projects are initiated by RSIs, seeking the cooperation of the other parties and an application from one of them to begin a project. The particular duties of RSIs are described later in this chapter.

Funding available for the GCIP has been nominally set at \$10 million annually over the last five years.

GRADE CROSSINGS: "ACTUAL" SPENDING<sup>12</sup>

1989–1990	\$7,006,000
1990–1991	\$9,790,000
1991–1992	\$8,471,000
1992–1993	\$7,182,000
1993–1994	\$9,000,000
1994–1995	\$9,000,000
	(Forecast estimate)

### Program Process: Application and Evaluation

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Section 12 of the *RS Act* requires the formal proposer of a crossing improvement to be a railway or road authority, because they own the rail or the road. In fact, however, it is the RSIs, through their inspection patrols and knowledge of their regions, who usually assess the crossings and call the "site meeting." This is the first formal step in the process towards an eventual agreement to improve a crossing. The RSD estimates that 95% of cases are initiated by RSIs.<sup>13</sup>

Under the current process, a particular crossing may be targeted for upgrading for a variety of reasons; for example, an accident or a traffic increase may draw attention to the crossing. Railway and road authority representatives attend the site meeting, evaluate the situation and, usually at the urging of the RSI, agree on a plan. Notification of intent is passed through Transport Canada Surface Group's regional office to HQ. The RSD reviews the request, assigns a file number and returns it to the region for a formal application by one of the other parties, usually the rail company. Once the assessment and estimates have been done, the application, now formally acknowledged, goes to HQ and joins the list of potentially fundable applications. In examining the RSD database, the Committee learned that, since January 1, 1987, there have been 694 applications approved for funding, 241 not yet approved but considered possible, and another 200 received but not recommended for funding, for a total of 1,135 applications.

According to the RSD, selection of projects for funding from the eligible applications is relatively straightforward. Regional offices are requested to designate each of their projects as of high, medium or low importance, and to establish priorities on the basis of their first-hand experience with all the locations and their assessment of the safety issue at each. The projects are then ranked nationally. At any one time, there may be 200–300 active projects receiving funding, with several hundred more on file at the RSD awaiting funding priority or recorded as possible projects.

Both quantified and unquantified safety factors are considered in the RSD's assessment of an application for funding. The seven quantified factors are:

- *Cross-product*: The annual average daily number of train movements multiplied by the number of vehicles using a crossing. A low priority cross-product would be 200 and a very high priority would be 200,000.
- *Speed*: The posted speed limits (not actual speeds) of both trains and vehicles.
- *Sightlines*: The distance and angle at which a train can be seen clearly.
- *Alignment*: The angle at which a road intersects a rail line.
- *Signal visibility*.
- *Nature of railway operations*.
- *Traffic at nearby intersections*.

RSD staff use only two of these seven factors (cross-product and train speed), combined with two other factors (project type and regional rank), to determine which crossings will be made safer, when and how:  $TS^2 \times CP \times PT \times RR =$  national ranking for priority list. Train speed is squared in the formula because speed is considered a general indicator of accident severity. If an existing installation is being improved (e.g., the addition of a gate where there are already lights), a value of "1" is assigned in the formula. A completely new installation, however, is given a value of "2" and thus receives greater weight in the determination of priorities.

The list is "adjusted" for other factors outside the formula, e.g., severely restricted sightlines, accident history, significant variations in train speeds, engineering experience and "fiscal realities."<sup>14</sup> Once more subjective factors are introduced, the clarity of the evaluation is lost.

Once a general ranking has been obtained, a fit must be made with project applications and the money made available to service them. HQ staff then place their priorities in a "cluster" ranking — high, medium, low — and let the regions know where they stand. RSIs then attempt to explain the situation to road and rail authorities. At least one regional engineer in the Surface Group told the Committee that he had no true understanding of what transpires at HQ during the foregoing process. However, the RSD is confident that those projects with higher probabilities of fatalities and accidents are being funded and that those of lower priority are being left until resources become available. No other evidence was advanced to justify this confidence.<sup>15</sup>

Lists of suggested project expenditures are submitted through the system for ministerial approval. This approval is required expeditiously, given the short season for the planning and construction of improvements. Projects can be rushed, but delays can mean waiting an entire year because of Canadian winters. This puts lives at risk, especially at high-priority crossings.

While it is usual for a department to vet projects thoroughly and to submit those judged most worthy of financial assistance, and while it is usual for the Minister to accept recommendations, there is a question as to whether decisions have always been based on public safety interests. This perception gives cause for concern, and that is augmented by the subjective nature of approvals.

***Range of Payments*** In the RSD's recent corporate memory, only 2 of roughly 2,000 applications for funding have proposed that the federal government pay less than 80% of the costs. Costs recorded in files range from \$2,000 or \$3,000 for adding lights at a crossing, through \$30,000 to \$90,000 for FLBs, to \$250,000 for FLBGs at a new crossing.<sup>16</sup> Most payments go to railways, as they usually take charge of approved work. (Railways are also responsible for maintaining the rail aspects of crossings, and road authorities are responsible for the highway aspects.)

## Conclusions

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- Approximately \$9 million is spent annually to change or upgrade a very small proportion of Canada's 23,500 public crossings — between 100 and 200 crossings per year.
- Criteria for determining the need for and type of protection at crossings are established, but only two of the seven are used. The subjective criteria should be quantified and a formula applied. More weight should be given to such factors as a crossing's accident history.
- The potential benefits of the GCIP have not been fully realized, largely because of a willingness to finance improvements that do not include gates. One British estimate suggests that gates are 20 times more effective than gateless crossings.
- Spending on preventive education, trespass prevention and research has been extremely limited. The small federal grants made to Operation Lifesaver appear worthwhile, and many in the rail safety business agree that public education is an effective way to attack the crossing problem but that more money and effort are needed.



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## RECOMMENDATION 6.2

We recommend that Transport Canada establish and publish clear objective criteria to guide applications relating to grade crossing improvements and that an up-to-date comprehensive list of prioritized grade crossing improvement projects be publicly available.

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### LEGISLATIVE IMPEDIMENTS TO SAFETY AT GRADE CROSSINGS

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As has been discussed elsewhere, the Minister of Transport may authorize grants for proposed railway works (including grade crossing improvements, grade separations and relocation of public roads), but only if someone else applies under Section 12 or 13 of the Act. In reviewing the program, the Committee learned that Transport Canada has sometimes been unable to proceed with deserving projects because the other parties were unwilling to provide funding or to accept liability in the event of an accident. The Committee believes that the *RS Act* should be amended to allow, at the Minister's initiative, the authorization of grants or work ordered on crossings and grade separations. The railways generally support such an extension of ministerial authority.

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## RECOMMENDATION 6.3

We recommend that the *Railway Safety Act* be amended to give the Minister of Transport power to order work for grade crossing improvements and to authorize grants on his or her own initiative where, in the Minister's opinion, it will enhance safety.

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The *RS Act* empowers the Governor in Council to make regulations on the removal of anything, including trees or brush, that might be a threat to safe railway operations. Section 24(2) stipulates that where, for example, the owner of land adjoining railway land suffers damage

due to the operation of such regulations, the railway concerned must pay that person compensation. In conjunction with this authority, the *RS Act* enables a railway to prevent threats to safe rail operations by going onto adjoining land, for example, to cut down brush grown in contravention of regulations made under Section 24(1)(e). The government has not made these regulations; thus, railways cannot use this power.

Transport Canada's decision not to proceed with regulations has not increased the risk to rail safety, because Transport Canada inspectors have the power to slow or even stop trains at crossings considered a threat to safety. In the Committee's view, however, such measures attack the symptom rather than the disease, and they impose unnecessary costs on the railways, because permanent orders to slow down can result where an obstruction is not removed.

The Committee believes that local authorities should be empowered to clear sightlines on their own, if they perceive a threat to safety. The Committee further believes that railways should not have the sole responsibility for the clearing of obstacles.

The Committee is also concerned that the railways are made solely responsible for paying compensation to owners of adjoining lands. It is evident that one of the beneficiaries of clearance activity is the motoring public. Railways also gain because clearance reduces the possibility of accidents and the need for orders to slow down, which undermine the efficiency of railway operations. Thus, a more equitable arrangement appears warranted.

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#### RECOMMENDATION 6.4

**We recommend that regulations be promulgated under Section 24(1)(e) of the *Railway Safety Act* to enable railways to exercise their authority to clear sightlines. We further recommend that the regulator explore the possibility of sharing the authority for entering adjoining lands to clear sightlines with provinces and municipalities.**

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## RECOMMENDATION 6.5

**We recommend that Sections 24(2) and 25(3) of the *Railway Safety Act* be reviewed with a view to achieving a fair resolution of the issue of compensating private landowners, including a determination as to whether and by whom compensation should be paid.**

### Private and Farm Crossings

The *Railway Act* contains provisions that have an impact on grade crossing safety, especially as regards private and farm crossings. In summary, the Act requires a railway company to make a crossing for people “across whose lands the railway is carried” and one that is “convenient and proper . . . for farm purposes” (Section 215). Furthermore, the NT Agency can order a railway, on the application of any landowner, to provide a suitable farm crossing wherever the Agency thinks it necessary for the farmer’s enjoyment of the land.

The Agency may order “how, when, where, by whom and by what terms and conditions the farm crossing shall be constructed and maintained.” As well, its orders in this regard must be consistent with the *Railway Act* (Section 216(2)). However, no rules have been stipulated for such crossings (or, for that matter, any crossings). At present, there are only guidelines.

Railways consider the existence of any crossing at grade to be a hazard to safe train operations, and as a result they have made efforts to limit the number of private crossings allowed across their tracks. Private crossings can present safety hazards as great as or greater than public crossings. For example, in August 1994, a heavy tractor-trailer loaded with gravel went through a well-marked stop sign at a private crossing used to serve a quarry near Trout Creek, Ontario, and collided with a train. This resulted in the death of the driver, derailment of 27 CN rail cars, a sizeable spill of sulphuric acid, nearly \$5 million in clean-up and repair costs to the railway, and a major disruption to traffic on Highway 11, including a five-day detour of some 300 km.<sup>17</sup> (In the photo on the following page, the crossing is at left).



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Private and farm crossings present many safety concerns, such as inadequate maintenance, poor sightlines, lack of crossing protection, poor approach grades and general inattention by crossing users.

An example such as the Trout Creek incident illustrates why private crossings concern the Committee. It notes that there has been little improvement in the safety record of private and farm crossings.

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## RECOMMENDATION 6.6

**We recommend that Transport Canada work in concert with the railway industry and other relevant authorities to establish safety standards for all types of railway crossings in Canada, and that, following the determination of acceptable standards, a plan be developed to ensure that all railway crossings meet the new standards within a specified time or be closed.**

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## TRAIN WHISTLING

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Many municipalities raised concerns about train whistling. The City of Calgary, for example, does not believe its by-law actions to disallow whistling at crossings have caused any serious safety problems.

Prior to 1989, under the *Railway Act* (Section 250(1)) a train was required to whistle and ring its bell when approaching a crossing until the locomotive had crossed the highway. However, the Act went on to relieve the railway of this obligation whenever an urban municipality passed a by-law prohibiting whistling or bell ringing at any crossing



within the municipality and the by-law had been approved by the CTC/NTAgency. If, in the absence of such a by-law, the train did not sound the whistle and bell, the rail company was subject to a penalty of \$8 (under the former Section 370).

The *RS Act* raised the maximum fine to \$200,000 in 1989, but municipalities could no longer appeal to the NTAAgency to stop whistling at specified crossings. They were now obliged to deal directly with railways on this issue. Prior to complying with a by-law, one Class I railway (CP) asks municipalities to pay half the cost of liability insurance. (Calgary believes this to be an example of railways assigning their operating costs to others.) If a municipality refuses, the railway carries on whistling. Another Class I railway and most smaller railways, including some under provincial jurisdiction, may simply decline to obey such by-laws. CN has evaluated certain crossings and, where they meet Transport Canada guidelines, has authorized non-whistling. In 1994, accidents occurred at three of the crossings with “no whistling” rules in effect.<sup>18</sup>

Some municipalities believe that train whistling has no impact on safety. They consider anti-whistling by-laws to be acceptable, subject to the satisfaction of reasonable safety requirements. In this regard, the draft RSD manual on crossings contains language that clearly allows anti-whistling by-laws.

On the other hand, several organizations and other levels of government, including the transportation authorities in Nova Scotia and New Brunswick, do not support anti-whistling by-laws. Nova Scotia's Safety Council considers the local right to prohibit whistling a major issue and attributes at least one fatality to a failure to whistle. The Council calls for consistent application of the whistling policy. New Brunswick's Safety Council considers whistling necessary at all times. However, its members had doubts about the current rule that whistling begin a quarter of a mile before every crossing, given that trains travel



at different speeds.<sup>19</sup> The slower the speed, the later the whistle could be sounded, and vice versa.

The Committee is unclear as to why the *RS Act* did not maintain the former *Railway Act* provisions permitting anti-whistling by-laws, but, whatever the reasons, the decision to exclude them was entirely correct.

The Committee learned from the Federal Railroad Administration (FRA) that U.S. states are being encouraged to repeal anti-whistling statutes. It should be noted that whistling is mandatory for federally regulated U.S. railways, as a result of clear findings from the FRA's study of the effects of changing a Florida statute. Under former state law, only those crossings that had (two-quadrant) gates and FLBs could be subject to municipal ordinances banning whistling. The changed legislation allowed for any crossing to have an anti-whistling ordinance. The FRA wanted to determine the impact of such ordinances on night-time crossing accident rates.

The results of that study of more than 800 crossings (including a control group of 311 where whistling was still required) were compelling. Night-time accidents increased on all groups of crossings during the period of five and one-half years studied. The increase in night-time accidents at the control group crossings (whistling required) ranged from 23% to 67%. However, the increased night-time accident rate for crossings where whistling was prohibited was dramatically higher at 195%. On receipt of the report, the FRA issued an emergency order requiring all locomotives in Florida to sound their whistles at all crossings.

In Canada, whistling prohibitions can be in force 24 hours a day. In fact, CN's guidelines state that the railway company is "very reluctant . . . to consider part time anti-whistling."<sup>20</sup>

The lesson from the FRA study is that prohibition of whistling greatly increases the risk of accidents even at the best-protected North American crossings. On the basis of the FRA study, the Committee considers it highly likely that, especially with whistling prohibited 24 hours a day, there have been accidents as a direct result of anti-whistling by-laws in Canada. During 1994, as already noted, CN reported three accidents that occurred at crossings where anti-whistling rules have been implemented.



One can sympathize with those individuals who find the noise of train whistles difficult to bear, and can also appreciate the position of municipal authorities that seek to respond to the concerns of affected citizens. They may find consolation in knowing that, without question, whistles save lives and limit the rise in crossing accidents. Today, with steam locomotives long departed, train whistles are more like horns than whistles, but they remain very effective. They are as much a necessity as smoke detectors in homes and seat belts in cars.

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## RECOMMENDATION 6.7

**We recommend that Transport Canada undertake and publish a comprehensive evaluation of the impacts and effects of anti-whistling on safety and determine the type of protection required before anti-whistling is implemented at crossings. We further recommend that Transport Canada and the railways not approve any new anti-whistling agreements with municipalities until the review has been completed.**

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## RAIL CROSSINGS IN OTHER COUNTRIES

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The data in Table 6.4 suggest that there are considerable differences in the management of risk at rail crossings among selected countries studied in the course of the Committee's research.

In the United States, the FRA has relatively little authority over rail crossings, which are generally seen as a highway problem rather than a rail problem. Crossings fall into three major categories: passive; flashing lights; and flashing lights and gates.

Criteria for the installation of equipment are based on exposure, i.e., volume of traffic, and speed of trains at crossings. Risk management is complicated because, although railroads must report crossing equipment failures, nothing effective can be done if they do not comply. The FRA is usually unaware of equipment problems until they become very obvious. A major safety issue continues to be improperly functioning equipment, e.g., signals that activate although no train is near, resulting in local people tending to take crossing warnings less seriously.

**Table 6.4**  
**DEATHS AT GRADE CROSSINGS (1987–1992)**

Year	CANADA	U.S.	U.K.	Germany	France
1987	50	598	n.a.	n.a.	71
1988	58	652	13	n.a.	58
1989	85	757	14	62	71
1990	48	648	23	47	57
1991	63	565	n.a.	n.a.	73
1992	73	536	18	66	71
1993	56*	626**	n.a.	n.a.	n.a.

*Notes:*

\* Preliminary figure obtained from TSBC, November 1994.

\*\* Interview with FRA official, November 17, 1994.

n.a. = not available.

*Source:* Some numbers obtained from Hickling Corporation, "International Comparisons of Rail Safety Practices," Report prepared for the Railway Safety Act Review Committee, August 1994, p. ix.

The Committee has examined the results of a study done in Tennessee on the use of highway traffic signals at grade crossings in that state. For four months, municipal engineers field-tested the effects of highway traffic signals at crossings where standard flashing light signals had been in regular use. The research found excellent driver response and concluded that the traffic signals outperformed flashing lights on the key safety issues. There has been no history of train-car accidents at these crossings since the traffic signals were installed. The report suggests that traffic signals are both feasible and effective as a grade crossing control device. The study also reported on the situation in three other cities in Tennessee, where traffic signals had been put in place at crossings with very high volume (up to 30,000 vehicles per day). None of the cities has found compliance by motorists to be problematic. The report calls for more testing at additional sites and under varying conditions throughout the United States.

In March 1994, the Association of American Railroads (AAR) adopted a 10-point "Policy Agenda for the 1990s" to deal with the grade crossing and trespassing problems. In both areas, the program emphasizes driver and public education. It also seeks legislation on responsibility for deciding on the need for and choice of warning devices at crossings; guidelines on the elimination of crossings on high-speed lines; continued railroad research on ways to alert drivers; and an increase in grade crossing improvement funding (under the federal *Highway Safety*

Act) from C\$195 million to C\$240 million. (These figures are respectively twice and three times the level of equivalent Canadian funding.) The rate of fatalities at U.S. crossings is similar on a per capita basis to Canada's rate.

On June 13, 1994, the U.S. Secretary of Transportation announced a comprehensive 13-point action plan on rail-highway crossing safety. The plan aims to cut accidents and casualties in half by the year 2004.

The United Kingdom has conducted extensive studies on grade crossings. One study<sup>21</sup> proposed a standard for every "open automatic"

crossing (i.e., lights and bells, but no gate): the level of safety should be such that there should be no more than 1 fatality per 100 years at any particular crossing. As a result, although there are about 400 such crossings in Britain, certain crossings were recommended for upgrading. The study also found that even "the Automatic Half-barrier Crossing warning system with barriers allied to flashing lights is likely to be at least 20 times more effective in preventing collision than the unaided Automatic Open Crossing flashing lights" (emphasis added).<sup>22</sup> Although

*The lesson from the FRA study is that prohibition of whistling greatly increases the risk of accidents even at the best-protected North American crossings. The Committee considers it highly likely that, especially with whistling prohibited 24 hours a day, there have been accidents as a direct result of anti-whistling by-laws in Canada. During 1994, CN reported three accidents that occurred at crossings where anti-whistling rules have been implemented.*

the gateless, automatic crossing is by far the most frequently encountered "protected" crossing in Canada, the Committee is not aware of any research supporting the cost-effectiveness of such crossings.

In Germany, all lines carrying trains travelling more than 160 kph (equal to 100 mph, the maximum speed now permitted for Canadian passenger trains) must have grade separations. Germany has 25,000 crossings (about 20,000 fewer than Canada's total), most lacking technical protection. Most of these are in rural areas or on side and feeder lines.

German officials said that, as they reduce the number of grade crossings, motorists become less familiar with crossings. Ordinary traffic lights are being installed because they are considered a better warning device than flashing lights. Solid amber and red signals, corresponding to conventional road signals (but without the green), are used at many sites in addition to the flashing red.

All lines in France carrying trains travelling more than 160 kph must also have grade separations. France has conducted many studies and experiments to improve grade crossings. For example, to avoid trucks becoming stuck on the line after breaking through a barrier, the stop line is located three or four metres in front of the lights. France has also recognized the need to separate road lanes (e.g., by curbs) on approaches to crossings to discourage drivers from going around the open sides of half-barrier crossings.

The program for removing grade crossings is substantial, as France installs more high-speed rail lines. A grade separation costs about FRF8 million (C\$2.1 million), and 100 are built annually. Cost-sharing is decided by negotiations among the parties: the Société Nationale des Chemins de Fer Français (SNCF), and central and local governments.

Australia has many different types of crossings, varying among the states. In New South Wales, for example, the Roads and Traffic Authority funds safety improvements, sometimes in cooperation with a local council. In Queensland, local governments contribute nothing; the state and businesses finance crossing works. It is noteworthy that Australia currently has four different widths of rail and that efforts are ongoing to standardize all aspects of rail travel nationwide.

To address the grade crossing problem, the Committee believes that federal government leadership will be required. The Committee calls for Transport Canada to review certain provisions of the *RS Act* and to gather and disseminate information on certain key issues on which discussions must be ongoing with other levels of government and the railway industry.

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## RECOMMENDATION 6.8

**We recommend that Transport Canada develop a comprehensive plan to cut in half the accident rate at Canadian grade crossings within 10 years. The plan should not be limited to rules governing grade crossing improvements and separations, but should include research and education needs.**

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## RECOMMENDATION 6.9

**We recommend that Transport Canada investigate, in cooperation with the appropriate authorities in other levels of government and the railway industry, all financial and technical aspects relating to the use of traffic signals to prevent accidents at rail crossings.**

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## NEW TECHNIQUES TO DEAL WITH RISK AT GRADE CROSSINGS

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The last 80 years have seen major improvements in detection reliability and signal processing, but few are visible to the motorist. Gate barriers have been added, as have multiple two-light installations, and the basic cross-buck has also been modified. But the fundamentals of train detection, activation and warning devices remain functionally unaltered. Current devices such as driver simulation and human factors engineering evolved without the benefit of modern testing or evaluation techniques. Furthermore, the Committee has found no research evidence demonstrating the comparative safety value of existing or experimental devices.

### Future (Near-Term) Projects

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Two new versions of cross-bucks are under consideration: the Ohio Buckeye Cross-buck and a neon version. The key feature of the Ohio version, first used by Conrail, is a metal sheet mounted on the pole. The sheet is bent to a 45° angle to reflect train lights towards oncoming drivers. Half the installations in a 1993 Ohio program to install new cross-bucks are the “Buckeye” variety, and this will allow comparison with the old model.

The neon cross-buck is a similar device with the addition, in the cross-buck area, of neon tubes that switch from low to high intensity when a train is detected. These and other technologies, such as strobe and sequential lights, have not yet been installed or tested.

## High-Speed Rail Initiative: FRA-Funded Research Projects

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Canadians are beginning to think about high-speed rail. The United States is further ahead in planning and is beginning research on grade crossing and grade separation criteria. Under the FRA's high-speed rail initiative (HSRI), four research projects are in various stages of test or implementation:

***Advanced Grade Crossing Detection and Warning*** A four-quadrant gate will be installed at a single site, where geography prohibits grade separation and crossing closure, in the hope that the safety level will be sufficient.

***Friendly Mobile Barrier*** The project calls for a non-traversable, flexible barrier, which will stop a heavy truck without serious injury to the occupants and without the vehicle striking the train. Installation costs could reach U.S.\$1 million. Issues to be covered in the tests include frequency of hits before replacement is required; the effect of impacts other than head-on; and deployment capability in adverse weather conditions.

***Low-Cost Grade Separation*** This project aims to assess specific designs for low-cost grade separations. One prototype will be built at an estimated cost of U.S.\$500,000.

***Vehicle Proximity Alert System*** Four projects have been designed to alert the vehicle driver (and sometimes the train engineer) to possible conflicts at crossings.

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### RECOMMENDATION 6.10

**We recommend that Transport Canada undertake a review of Canada's standards for grade crossings on high-speed rail lines in conjunction with an analysis of high-speed rail abroad to ensure that Canadian standards are maintained at the highest practical level.**

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## Other Devices Being Studied

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The Committee was told about a number of new technologies under development. Projects to develop Dragnet Protection, Rigid Barriers and Remote Locked Gates may evolve into useful tools to reduce collisions at grade crossings.

In the more distant future, we may see Intelligent Vehicle Highway Systems (which apply microcomputers and communications to transportation); Global Positioning Systems (to accurately locate objects on earth); Video Detection (the use of enhanced computer routines to detect/decode designated targets, including vehicles, trains and people); and Automatic Vehicle Control Systems (vehicle-installed hardware and software that detect potential collisions and warn drivers to take evasive action).

## Conclusions

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None of the technologies reviewed has received sufficient control and field-testing to make any determination of its applicability.

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### RECOMMENDATION 6.11

**We recommend that Transport Canada, the railway companies and other responsible parties jointly undertake research to achieve increased safety in driver responses at rail crossings, and that such research include an assessment of the technical feasibility, cost and behavioural implications of new technologies.**

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## TRESPASSING

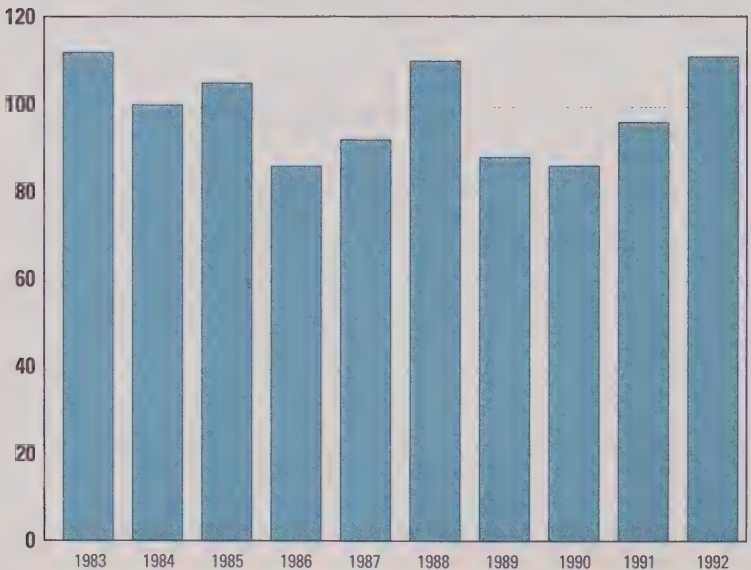
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Trespassing on railway property has long been a major problem. Coinciding with the Committee's review of the *RS Act* was the review of a recent legislative provision making trespassing on federally regulated railway property illegal and allowing for monetary fines. The enforcement strategy for the new provision has yet to be finalized.

The Committee is extremely concerned about the number and nature of accidents and fatalities caused annually by trespassing on railway property. As can be seen from Figure 6.7, these occurrences are far too numerous. The Committee believes that their elimination should be a priority for the regulatory authorities and the railway industry.

Trespassing creates risks beyond those to the personal safety of the trespasser; those who enter railway property illegally and perform acts of vandalism create huge potential risks to human life and property. The Committee notes with some alarm the proliferation of such behaviour, as illustrated by events that took place as recently as the third week of November 1994. In Rimouski, Quebec, vandals placed cement blocks on the switches and caused a derailment, fortunately with no resultant injuries. Near Brighton, Ontario, an act of sabotage caused a major fire on a VIA Rail passenger train, injuring more than 40 passengers and resulting in several million dollars' worth of damage to the train. Miraculously, derailment was avoided, likely saving hundreds of lives.

**Figure 6.7**  
**NUMBER OF TRESPASSERS STRUCK BY ROLLING STOCK**



Source: TSBC, *Annual Report, 1992* (Ottawa: Minister of Supply and Services Canada, 1993), p. 46.

Although the Committee has reviewed some information, it was not made aware of any major studies on the causes of, or remedies for, trespassing.

Nothing the Committee has encountered explains what it is that motivates some people to trespass into an area where they are at such high risk. Certainly, everyone would benefit from additional research into the psychological and sociological aspects of such a dangerous activity.

In the meantime, the Committee can only stress the importance of education and public information by reinforcing its previous recommendation for joint efforts at public education on the part of the federal regulator, other levels of government and the railway industry.

Future research should be focused on the reasons for, and means to prevent, trespassing behaviour.

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## RECOMMENDATION 6.12

**We recommend that Transport Canada, other authorities and various affected parties sponsor research to determine the most effective ways of understanding and reducing or eliminating trespassing on railway property. The research should deal with behaviour, enforcement, public education and prevention.**

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## TICKETING

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In recent years, the federal and provincial governments have placed greater reliance on ticketing for minor regulatory and other infractions (such as parking violations at airports). At the federal level, the effectiveness of this approach as a deterrent has not yet been fully assessed. Nonetheless, the Committee believes that a properly designed compliance strategy, including fines, could deter trespassing, and it considers it appropriate that such a system be implemented and enforced.

## RECOMMENDATION 6.13

**We recommend that authority be given to issue tickets for violations of anti-trespassing rules, under either the as yet unproclaimed federal *Contraventions Act* or the *Railway Safety Act*.**

## NOTES

1. W. Knott, "Railway Safety Directorate Funding Actions," Report prepared for the Railway Safety Act Review Committee, August 1994, p. 9.
2. *Ibid.*
3. NTAgency Schedule "A," 1994 Maintenance and Construction Rates, cited in W. Knott, *op. cit.*, p. 12.
4. Hickling Corporation, "International Comparisons of Rail Safety Practices," Report prepared for the Railway Safety Act Review Committee, August 1994, pp. 3–14.
5. Hickling Corporation, "Grade Crossing Issues," Report prepared for the Railway Safety Act Review Committee, July 1994, Executive Summary.
6. Section 4 of the TSBC regulations.
7. "Transport Canada 1994–95 Estimates, Part III, Expenditure Plan" (Ottawa: Minister of Supply and Services Canada, 1994), p. 2.62.
8. *Ibid.*, p. 2.65.
9. W. Knott, *op. cit.*, p. 3.
10. Review of Operation Lifesaver Program TP 103 77E, prepared for Transportation Development Centre, Transport Canada, by Government Consulting Group, June 1990.
11. The *RS Act* allows the Minister to authorize grants that "shall not exceed eighty per cent of the construction or alteration cost of the work" (Section 12(5)), but does not specify how the remaining 20% is to be allocated. This leaves a certain degree of flexibility, and the NTAgency has exercised this authority on occasion to adjust the respective shares.
12. In 1909, the federal funding available for grade crossing improvements was \$200,000. Allowing for inflation, this would amount to just under \$3 million in today's dollars. Comparisons would be misleading, however, given the major changes that have taken place, such as, for example, in the number of vehicles on the road.

13. W. Knott, *op. cit.*, p. 20.
14. *Ibid.*, p. 25.
15. Memorandum containing written answers to questions posed to the RSD, July 1994.
16. W. Knott, *op. cit.*, p. 28.
17. *Almaguin News*, August 10, 1994, p. 1.
18. The locations were at Mile 73.1 (Dundas), Mile 101.28 (Joliette) and Mile 40.74 (Rouses Point).
19. Information provided during an oral presentation to the Committee at the Halifax/Moncton meeting, June 10, 1994.
20. CN North America, Safety and Regulatory Affairs, Regulated Work Guide, *Anti-Whistling*, rev. July 1994, p. Eng 4.2.
21. Hickling Corporation, "International Comparisons of Rail Safety Practices," p. 3.4.
22. *Ibid.*

## RAIL SAFETY AND THE ENVIRONMENT

*Railways are far less polluting  
than any other form of  
surface transportation.*



### INTRODUCTION

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In recent times, environmental concerns have become an integral part of decision-making around the world. Now, as we approach the twenty-first century, the importance of maintaining our ecosystem in a sustainable manner has become an even higher priority.

The *Railway Safety Act (RS Act)* makes no specific mention of the environment. The Committee found it difficult, however, to separate safety-related environmental issues from general environmental issues and, in the interests of completeness, chose to examine the railways' interface with the environment in the overall context of sustainable development.

Sustainable development integrates the environment and the economy so that the two are inseparable. With this in mind, transportation creates an interesting paradox: it is vital to the human population and has the potential to improve its welfare, but it also depletes and displaces natural resources. Thus, the elements of the environment and the economy must be balanced to produce a sustainable transportation system.

The challenge for the transportation industry is to develop in a manner that maintains a balance between the constructive and destructive elements of movement and growth. This chapter examines the rail sector and its relationship to the environment. The Committee believes that, at present and looking to the future, it is impossible to examine safety without considering the environment. Safety means more than the avoidance of harm to people and property; it also involves the harm that will befall everyone if steps are not taken to protect our shared environment. This relationship is made clear in Transport Canada's mission statement, which provides "... for a safe, environmentally sound, national transportation system ..."<sup>1</sup> The Railway Safety Directorate (RSD) goes even further in demonstrating the correlation between envi-





ronmental protection and safety in its mission statement, which pledges “to ensure safe and environmentally sound railways in Canada.”<sup>2</sup>

The environmental aspect of safety is highlighted by incidents that relate directly to the health of people and the environment, such as the spill near Oakville, Manitoba, in December 1992.<sup>3</sup> A CN/CP line merger has the potential to cause an increase in rail traffic through Algonquin Park, confirming the need to examine the relationship between transportation and the environment.

## ENVIRONMENTAL PROTECTION LEGISLATION

Although there are no specific references to the environment in the *RS Act*, current environmental legislation, such as the *Canadian Environmental Protection Act (CEPA)* and the *Canadian Environmental Assessment Act (CEAA)* (yet to be proclaimed), applies to rail transportation in Canada.

Since the late 1960s, environmental considerations have gained prominence in public and private decision-making. A 1973 Cabinet directive established the Environmental Assessment Review Process (EARP) to ensure that all federal departments, Crown agencies and private companies receiving federal funding carry out environmental assessments for any projects with potentially adverse effects on the environment.<sup>4</sup> The objective of the EARP process is to examine possible environmental effects at the project's planning stage. Environmental assessments have been used as a tool to predict the potential environmental effects of proposals requiring a federal government decision.

The *CEAA*, which has received Royal Assent and is awaiting proclamation,<sup>5</sup> sets out the federal government's responsibilities and the procedures for the environmental assessment of projects. It also establishes a new agency, the Canadian Environmental Assessment Agency.

One major difference for railway works and operations under the *CEAA* regime is the inclusion of railway abandonments in the environmental assessment process. Abandonments are not currently covered under the *EARP*. Under the *CEAA*, an environmental assessment must consider the total environmental impact of rail line abandonment, examining the effects of abandonment on road and rail traffic congestion and addressing the issue of potential accidents involving dangerous goods.

Under the *CEAA*, however, certain projects will be exempt on the basis that their environmental impact would be limited or, in cases where environmental impact would be significant, that the financial contribution from a federal agency is minimal. In this respect, the degree to which the federal government is associated with or a proponent of a project is a factor in determining whether an assessment is required.

Federally regulated railways will be subject to environmental assessment, whereas provincially funded and regulated highways in Canada will be exempt from the federal environmental assessment process. Given the jurisdictional difference between modes of transport, the extent of environmental impact will not always be consistently assessed. It is important to regulate transportation in such a way that the environmental impacts of all surface transportation modes are equitably addressed.

Environment Canada has primary responsibility for ensuring environmental protection as it applies to railways and regulates railway operations under the *CEPA*, which is jointly administered by Environment Canada and Health Canada and is presently under review. Currently, the *CEPA* provides the authority to regulate fuels and emissions and toxic substances and applies to some emissions from railway locomotives and automobiles.

Federal environmental screening procedures will apply to highways in instances where federal authorities are involved as proponents or where federal funding is entailed. Nonetheless, in the interests of fairness and consistency, the Committee believes that the same degree of environmental scrutiny and regulation should be applied to highways and railways. This situation will not change with the coming into force of the *CEAA*.

## THE REGULATORS

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Overall, the railways seem to accept that the RSD's mission statement is meant to ensure that they maintain an acceptable level of environmental protection. The RSD's main involvement stems from the fact that Section 10(1)(a) and (b) of the *RS Act* comes under the EARP guidelines. This section specifies conditions under which ministerial approval is required and applies only if proposed railway works depart "from any applicable engineering standards" or if there is "an outstanding objection." Because most projects adhere to applicable engineering standards, the RSD actually assesses only a small percentage of the projects conducted.

The National Transportation Agency (NTAgency) has a much larger role than the RSD in environmental protection. The NTAgency is required to conduct environmental assessments of any projects listed in the *Railway Act* that come under EARP guidelines. The assessments cover the potential environmental impact of any particular project. As the Agency is ultimately responsible for approving projects in the form of an order, Agency orders reflect the outcome of the projects' environmental assessments.<sup>6</sup>

The creation of a Memorandum of Understanding (MOU) would formalize a system for enabling Transport Canada, Environment Canada and the NTAgency to exchange information regarding environmental issues. Such an MOU could cover gaps in existing procedures and outline the agencies' respective roles under the *CEAA*. If the RSD is serious about providing "safe and environmentally sound railways,"<sup>7</sup> it must be kept up to date with and well informed of changes in environmental legislation now and in the future. An MOU between agencies would encourage better communication for the purpose of ensuring environmental protection as it applies to railway operations.

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### RECOMMENDATION 7.1

**We recommend that a Memorandum of Understanding between Transport Canada, Environment Canada and the National Transportation Agency be developed for the purpose of ensuring environmental protection as it applies to railway operations.**

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## ENVIRONMENTAL PROTECTION ISSUES

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Most of the transportation modes contribute significantly to air pollution and global warming. In fact, it has been estimated that, worldwide, the transportation sector's contribution to global warming is roughly 20% of the total from all anthropogenic sources.<sup>8</sup> The transportation modes are responsible for emitting compounds such as carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO) and nitrous oxides (NO<sub>x</sub>), as well as other harmful pollutants. In addition, transportation can have direct impacts on land and natural resources.

### Energy Efficiency

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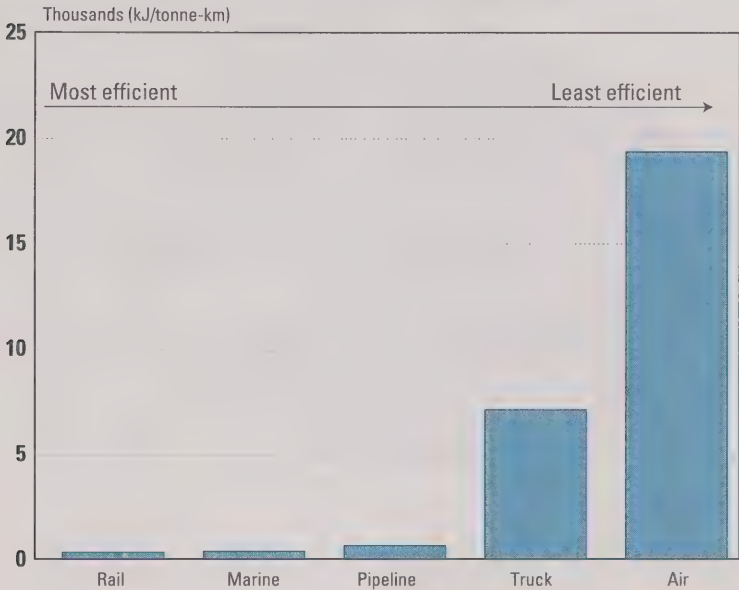
Energy efficiency is an important economic consideration for transportation. To minimize negative impacts on the environment, transportation companies must increase the efficiency of energy consumption. In Canada, the transportation sector is the largest user of petroleum, accounting for 65.4% of total consumption in 1988.<sup>9</sup> Of the petroleum used by the various transportation modes, rail's share is very small relative to that of trucking. The estimates of total (aggregate) energy presented in Figure 7.1 were derived from both direct and indirect energy consumption. It is evident that nationally, at the aggregate level, rail freight is the most efficient user of energy (in tonne-kilometre terms).

Table 7.1 ranks the rail, marine, trucking and air modes with respect to their discharge of emissions into the atmosphere for five categories of pollutants: NO<sub>x</sub>, volatile organic compounds (VOCs), particulate emissions (PM) (soot, dust, etc.), CO and CO<sub>2</sub>. Nitrous oxides are particularly harmful with regard to global warming and are a major contributor to acid rain;<sup>10</sup> carbon monoxide has severe effects on human respiratory and cardiovascular systems. Rail is clearly the most efficient (least polluting) mode in four of the five categories and the second most efficient in the fifth.

It has been demonstrated that, overall, rail is the most environmentally sound mode in terms of emissions and trucking is the least desirable.

... All the transportation modes contribute significantly to air pollution and global warming, through the emission of various compounds ... This is especially true of the trucking mode ...<sup>11</sup>

**Figure 7.1**  
**ESTIMATED AGGREGATE FUEL EFFICIENCY, 1988**



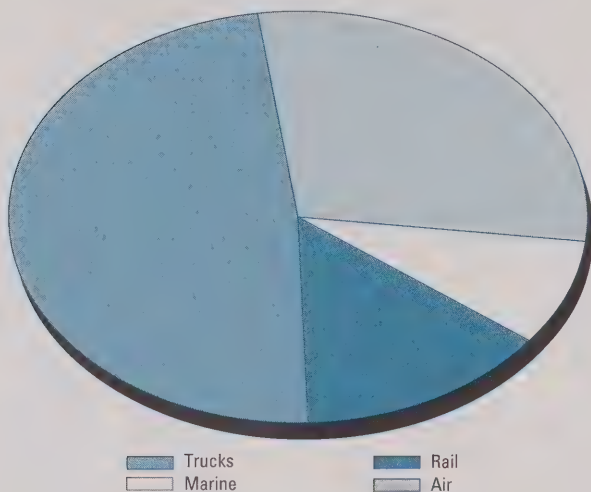
Source: A.M. Khan, "Energy and Environmental Factors in Freight Transportation," Paper prepared for the Economic Research Branch, Transport Canada, July 1991.

Rank	NO <sub>x</sub>	VOCs	PM	CO	CO <sub>2</sub>
1 – Most efficient	Rail	Rail	Air	Rail	Rail
2	Marine	Marine	Rail	Marine	Marine
3	Truck	Air	Marine	Air	Truck
4 – Least efficient	Air	Truck	Truck	Truck	Air

Source: Adapted from A.M. Khan, "Energy and Environmental Factors in Freight Transportation," Paper prepared for the Economic Research Branch, Transport Canada, July 1991, p. iii.

Trucks are ranked as the least efficient with respect to VOCs, PM and CO, and have a low efficiency ranking for NO<sub>x</sub> and CO<sub>2</sub>. As demonstrated in Figure 7.2, trucking is the largest contributor (48%) of CO<sub>2</sub> emissions of all the transportation modes considered.<sup>12</sup>

**Figure 7.2**  
**CARBON DIOXIDE EMISSIONS IN CANADA**  
 By transportation mode



Source: Sypher:Mueller International Inc., "Environmental Instruments and Transportation," Report prepared for the National Transportation Act Review Commission, August 1992, p. 5.

In terms of the combined emissions of CO, CO<sub>2</sub> and NO<sub>x</sub>, trucking creates about four times the emissions of railways.<sup>13</sup> A plan has been developed jointly by Transport Canada and Environment Canada to reduce emissions from internal combustion engines in order to protect the health of Canadians and the environment from damage caused by those emissions.

## Land Resources

While it has been demonstrated that transportation operations can have a direct impact on several components of the environment through emissions, these operations also encroach upon the environment in terms of land use (railway rights of way and highways). Highway construction for trucking and automotive transportation has resulted in the appropriation of large areas of valuable land. In Canada, highways take up approximately twelve times more land than railways. Evidence that rail is more economical than roads in land use is supported by the fact that 2 railway tracks can carry the same number of people in an hour as 16 lanes of highway.<sup>14</sup>



When distance is included, trains still outperform highways: railways carried 437 billion tonne-kilometres of goods in 1991 compared with 90 billion tonne-kilometres carried by highways.<sup>15</sup> From the perspective of ecosystem integrity, railways are the safest, cleanest and most suitable means of transporting people and goods.

## Waste Disposal

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The disposal of human-generated waste from toilet facilities presents a unique challenge for passenger rail. According to VIA, the disposal of waste onto the tracks is more an aesthetic than an environmental problem. In fact, in March 1989, Transport Canada formed a working group composed of representatives from National Health and Welfare, Labour Canada and Environment Canada to investigate with VIA the impact of waste disposal practices on the health of workers and on the environment. After careful review, the consensus was that there are "no unusual health or environmental risks" associated with the current practice of disposing of waste onto the tracks.<sup>16</sup>

In the United States, there have been several instances of people being hit by waste from passenger cars, resulting in lawsuits against railways. As a result, research has been conducted into various types of full-retention systems to replace the current systems. Based on the findings, the United States has plans to install retention toilets in all new rail cars by 1996, although it has been demonstrated that it is for aesthetic rather than environmental reasons. The passenger train service in Canada is exploring the feasibility of installing full-retention toilets. Because of cost considerations, VIA will replace current disposal systems on an incremental basis, and it is testing the feasibility of installing full-retention toilets on its coaches. The research and testing are expected to be completed by mid-1995.

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## RECOMMENDATION 7.2

**We recommend that all newly acquired rail passenger cars be equipped with toilet systems that have full-retention capability and that, where feasible, existing cars be retrofitted no later than the year 2005.**

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## ENVIRONMENTAL PROGRAMS

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### The Rail Industry

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The railways have comprehensive environmental programs that demonstrate a self-initiated willingness to minimize negative impacts on the environment and raise awareness at the employee level. These programs address a wide variety of concerns, such as fuel efficiency, waste disposal, air pollution and site contamination. Some examples of these programs follow.

**RAC** The Railway Association of Canada (RAC) has an Environmental Committee, whose aim is to encourage all members to achieve environmental protection. The RAC does not initiate environmental programs, but promotes environmental initiatives, leaving individual railway companies to be responsible for their own programs.

**CN** CN has a site assessment program, waste management initiatives and employee awareness training, and it conducts compliance audits. The aim is to control waste disposal and to conserve energy in daily operations. CN has a waste disposal review process to examine the reuse and recycling potential of its materials. CN's environmental initiatives reflect a sense of stewardship in protecting the sustainability of rail transportation while raising the safety and environmental consciousness of its employees.

**CP** CP's corporate environmental policy includes an Environmental and Safety Committee at the parent-company level (Canadian Pacific Limited). The CP programs include an environmental management program, an environmental auditing program and site assessments. It has focused on environmental awareness for employees by initiating the "You, Environment and Safety" (Y.E.S.) program. CP considers environmental awareness and protection a top priority, meriting the same kind of attention as workplace safety.

**VIA** VIA has a corporate environmental policy that includes a voluntary program of purchasing guidelines for materials, an anti-noise program, and energy conservation and waste reduction programs. VIA seeks to anticipate environmental problems rather than react to those problems once they have arisen.

***Emergency Environmental Plans*** Some comfort can be found in the fact that all Canada's freight-carrying railways have developed comprehensive emergency or disaster-response plans designed to mitigate the

environmental and other effects of any accident involving dangerous goods. There are many incentives for having such plans in place. In addition to securing the protection of their human and capital resources, railways are motivated to prevent environmentally damaging accidents or to lessen the impacts of such accidents should they occur. As part of their commitment to responsible transportation practices, the railways are participants in the Canadian Chemical Producers Association's Responsible Care Program, also known as TRANSCAER. Railways are also directly involved with municipal officials in their emergency preparedness/response training programs through participation in "controlled" accidents, which demonstrate the possible outcomes of railway accidents involving dangerous goods.

***Comparisons with Other Surface Modes*** The Committee examined the trucking industry for comparison, because it is the major surface alternative for shippers. It was felt that trucking, as rail's major competitor, might provide an environmental protection benchmark for the purposes of comparison.

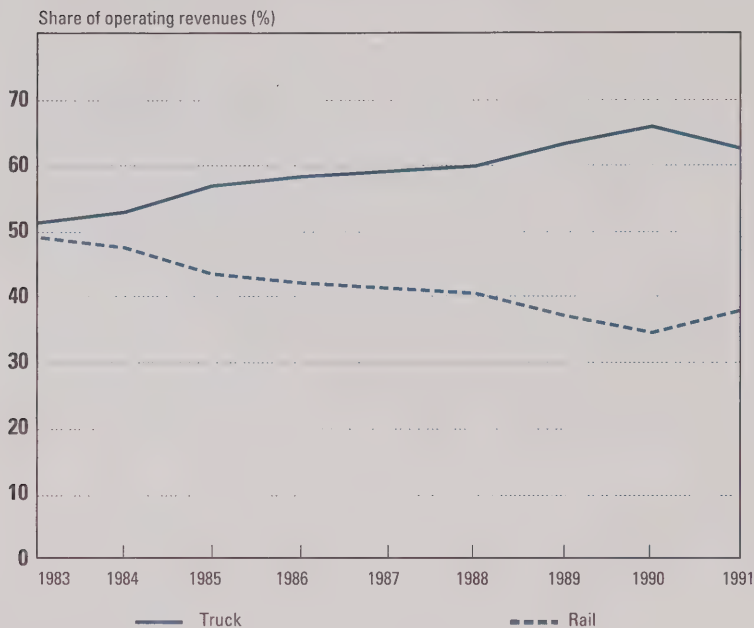
Unlike the situation with rail, the federal government has limited powers with respect to trucking, since responsibility for regulating the trucking industry resides with the provinces. However, a recent survey of trucking fleet organizations conducted by Natural Resources Canada found that the federal government is active in supporting environmental protection in the trucking industry. The federal government uses Natural Resources Canada's Pro Trucker program to encourage the trucking industry to improve fuel efficiency.

Trucking companies, however, have no specific environmental protection programs. Company-level programs focus on financial and efficiency matters, which sometimes overlap with environmental issues.

Until recently, shippers were dependent on trucks for handling fluctuating volumes of freight and for door-to-door delivery. Railways have responded by creating intermodal systems and by increasing the reliability of their services. This has resulted in increased market shares for the rail industry at the expense of the trucking industry (Figure 7.3).

Although the trucking industry is making strides in its response to environmental considerations, trucks remain more harmful to the environment and less safe than trains.

**Figure 7.3**  
**RAIL-TRUCK MARKET SHARES**



*Note:* Operating revenues for CN and CP, and for-hire trucking companies.

*Source:* Statistics Canada.

## CONCLUSIONS

The stakeholders interviewed and the available literature on railway works and operations consulted were in general agreement that there are no major unresolved environmental protection issues in the area of rail transportation. Railways are far less polluting and more energy-efficient than any other form of surface transportation.

The current self-assessment regime under which the railways operate appears to work well and is expected to change little under the *CEAA* and the *CEPA*. The Committee believes that current and planned environmental statutes, in conjunction with railway environmental programs, should enhance environmental protection.

Despite the environmental and safety advantages of rail transport, it is taxed more heavily and regulated more rigorously than trucking. At the same time, subsidies for passenger rail are being cut, and some of the rail lines in Canada are being abandoned. Such inequities appear to suggest that public policy favours road transportation. It is the Committee's view that the use of existing rail infrastructure should be promoted by Transport Canada to achieve maximum safety and environmental benefits.

Many Environment Canada and other government publications mention the need to move to full-cost pricing. Unfortunately, to date, no attempt has been made to assess the full social and environmental costs of the greater volume of motorized traffic on highways as a direct result of the increased pace of rail line abandonments. When rail lines are abandoned and a switch to trucking occurs, it is essential to implement a complete environmental assessment that considers factors such as air pollution, since a shift away from rail transport in favour of trucking may have negative effects on the environment and on safety. For instance, it has been demonstrated that a switch from rail to truck of 2.2% in total tonne-kilometres results in an increase in emissions of between 4% and 7%.<sup>17</sup>

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### RECOMMENDATION 7.3

**We recommend that the *National Transportation Act, 1987* be amended to require that any application for a rail abandonment be accompanied by a full assessment of its environmental impact, to include factors such as increased congestion of highways, increased pollutants and risk analysis, and that the results of such an assessment be considered in the approval process.**

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In addition, the Committee believes that, in order to ensure consistency in the environmental protection standards for transportation in Canada, highways and railways must be treated equitably.

## RECOMMENDATION 7.4

**We recommend that Transport Canada and other government agencies review both the current regulatory arrangements and the sources of funding for transportation infrastructure investments for the purpose of creating greater balance between highway and rail. Any policy proposals should address factors such as safety and environmental protection.**

Transportation in Canada has widespread effects on the environment. Too often, environmental protection issues are not addressed because of the difficulty in assigning the costs necessary to ensure protection. It is essential to approach transportation from a life-cycle perspective and, on that basis, to take into account the environmental impacts of human activities.

As we look to the future, railways deserve further consideration as a viable transportation alternative, for environmental and safety reasons.

## NOTES

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3. Transportation Safety Board of Canada, *Annual Report, 1993* (Ottawa: Minister of Supply and Services Canada, 1994), p. 24.
4. "The Provisions of the Policy of the Government of Canada Establishing the Federal Environmental Assessment and Review Process."
5. Interview with Federal Environmental Assessment Review Office officials, November 1994.
6. Interview with NTAgency official, September 1994.
7. Transport Canada, "Railway Safety Directorate 1993/94 Highlights," p. 1.
8. D.A. Lashof and D.A. Tirpak (eds.), "Policy Options for Stabilizing Global Climate," Report to Congress, U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Washington, D.C., 1990. Cited in D.L. Greene, "Transportation and Energy: The Global Environmental Challenge," *Transpn. Res.-A*, Vol. 27a, No. 3 (1993), p. 164.



9. A.M. Khan, "Energy and Environmental Factors in Freight Transportation," Paper prepared for the Economic Research Branch, Transport Canada, July 1991, p. 8.
10. G.T. Miller, Jr., *Living in the Environment: An Introduction to Environmental Science*, 6th ed. (Belmont, CA: Wadsworth Publishing Co., 1990), p. 504.
11. National Transportation Act Review Commission (NTARC), *Competition in Transportation: Policy and Legislation in Review*, Vol. I (Ottawa: Minister of Supply and Services Canada, 1993), p. 51.
12. Sypher:Mueller International Inc., "Environmental Instruments and Transportation," Report prepared for NTARC, August 1992, p. 5.
13. C. Holloway, "The State of Canada's Railway Industry and Resulting Environmental Implications: A Review," Report prepared for Environment Canada, May 1994, p. 2.
14. *Ibid.*, p. 47.
15. *Ibid.*, p. 14.
16. Information obtained in a letter from Transport Canada to Mr. James K. Allen, Senior Counsel, VIA Rail Canada Inc., March 1989, to the effect that there is no problem associated with the practice of direct dumping of human waste on railway tracks. The information was confirmed in a memorandum to the Railway Safety Act Review Committee, November 1994.
17. Sypher:Mueller International Inc., *op. cit.*, p. 23.

## SUBSTANCE USE AND ABUSE

*It would be most regrettable  
if the issue of substance use  
by Canadian railway  
employees came to a head only  
after a tragic rail accident  
resulting from substance use.*



### THE HISTORY OF THE TESTING DEBATE IN CANADA

#### Summary

The issue of substance use and testing is very much part of the rail safety debate, in that anything that impairs the performance of employees in a safety-sensitive position must have a negative impact on safety. The Exxon Valdez oil spill is one of a number of incidents that graphically illustrate the dire consequences that ensue when those in safety-sensitive positions are unable to perform their jobs due to impairment.

“Substance” includes alcohol (a legal drug), prescription drugs and illicit drugs. While the use of different drugs may have varying effects and the legality of their use may differ, all have the potential to cause impairment.

Particularly within the transportation industry, the issue of testing for substance use in the workplace has been on the agenda for several years.

In 1987, Transport Canada conducted a survey on substance use among railway employees in safety-sensitive positions.<sup>1</sup> This survey, which canvassed employees for voluntary statements, provided a sampling of evidence on the extent of potential on-the-job problems stemming from alcohol and drug use. The survey discovered, among other findings, that, at some time in the past,

- 4.4% of all respondents (and 6% of engineers) had reported to work within two hours of consuming at least four alcoholic drinks;
- 15.2% of all respondents had reported to work within two hours of consuming one or more alcoholic drinks;

- 20.6% of all respondents had come to work feeling the effects of alcohol; and
- 51.6% of all respondents had experienced instances in which they felt that alcohol use by other railway workers had compromised safety on the job.<sup>2</sup>

With respect to illicit drug use, 2.6% of all respondents said they currently used marijuana or hashish four or more times a week, although the authors felt that drug use was likely under-reported.<sup>3</sup> Stakeholders suggested to the Committee during consultations that the situation had improved, but there are no supporting data.

In the survey, 77% of the 1,060 employees interviewed agreed with the statement, "If it was discovered that alcohol and drug use was a problem for railways, I believe that drug testing should be mandatory."<sup>4</sup>

**Annual Medical** Testing for and/or reporting of a substance use/abuse problem, as identified by a physician.

**For-Cause Testing** Testing done on an individual when the supervisor has reasonable grounds to believe that the person may be under the influence of drugs or alcohol. (It may also include subsequent random testing of an identified user to monitor abstinence, treatment and rehabilitation during a probationary period.)

**Post-Incident Testing** The testing of all personnel directly involved in a workplace accident or incident in which human error or involvement cannot be ruled out as a contributing cause.

**Pre-Employment Testing** The testing of job applicants as part of an initial screening process.

**Random Testing** Testing done at unannounced intervals without any specific reason. The selection criteria to determine who will be tested on any given day must be truly random and neutral, and the fraction of the population tested annually should be no larger than that required for reliability. The population subject to testing could be a subset of the work force identified as being in safety-sensitive positions.

**Testing After Reinstatement** Testing following treatment and counselling as a result of a positive test.

Transport Canada established a steering committee of stakeholders to help in the development of the *Railway Safety Act* (*RS Act*). In their meetings, government, industry and labour officials debated whether or not the legislation should contain provisions allowing or requiring substance testing and whether such provisions should specify the kind of testing.

The railways urged the inclusion of such provisions or regulations. At that time, CN and CP were conducting pre-employment tests on employees entering or transferring to safety-sensitive positions. The railways, appearing before the parliamentary Standing Committee on Transport (SCOT) during its review of Bill C-105 (the *Railway Safety Act*), cited the results of the Transport Canada survey and the alarmingly high positive test rates in their own pre-employment testing. At CN, 13% had tested positive and at CP, 16%, for the years 1986–1988.<sup>5</sup> The railways used these findings to support their call for enabling legislation to test for substance use. Specifically, the two major railways wanted support to conduct pre-employment, for-cause and post-accident testing, as well as testing during annual medical examinations.

At that time, the railway unions did not speak out against testing per se. Most recognized that the potential threat to safety posed by substance use was sufficient to merit any infringement on an individual's rights that testing might involve. The unions, however, believed strongly that testing could be effective and justifiable only if done in the context of an overall employee assistance program (EAP), in which employees with positive tests would be referred for counselling, assistance and reinstatement. Instead of having provisions for testing specified in the Act, the unions wanted any testing regime to be developed by the railways and the unions together in the context of an overall program. The Canadian Labour Congress was against testing for any reason.

In the end, the *RS Act* allowed for regulations to be made on “the control or prohibition”<sup>6</sup> of alcohol use among employees in safety-sensitive positions. In the absence of such regulations, the Act allowed for rules. No regulations were ever promulgated nor any rules made and approved. Moreover, to date, there have been no regulations or rules on the designation of safety-critical positions and on EAPs.

### CURRENT APPLICABLE LEGISLATION

Section 18 of the Act enables the Governor in Council to make regulations on the control or prohibition of drug and alcohol use. Specifically, Section 18(1) empowers the Governor in Council, among other things, to declare which positions in railway companies are critical to safe railway operations, to establish minimum medical and related standards to be met by people in those positions, to make regulations to control or prohibit the use of alcoholic beverages and drugs by those persons, and to establish support programs for those persons and standards applicable to such programs.

Under Section 19(1), the Minister “may, by order, require a railway company . . . to formulate rules respecting any matter referred to in subsection 18(1).” Section 20 allows railways to propose rules on such matters for the Minister’s approval.

Section 35(2) requires a physician to notify the railways of any medical condition of a patient holding a safety-sensitive position that is likely to threaten safe railway operations and to inform the patient of such a notification. With this notification, the patient “shall be deemed to have consented to the disclosure.” Alcoholism and drug addiction, therefore, are clearly conditions that must be reported to the railways.

The *RS Act* amended Section 253 of the *Criminal Code* to make it an offence to operate railway equipment while impaired.

### THE DEBATE CONTINUES

The Committee heard from many stakeholders and commissioned two research studies on the issue of substance use.

CN, CP and VIA told the Committee that they believe there is a substance use problem in the railways. Current figures for pre-employment testing are still around 11% for both CP and CN.<sup>7</sup> The Committee was told that there have been some employees in non-safety-sensitive positions who refused to take this test when about to be transferred to safety-sensitive positions. Consequently, they were not moved. In 1993, there were over 200 new cases in CP’s EAP in which employees voluntarily or by supervisor referral were treated for substance addiction.<sup>8</sup>

In June 1994, the railways, as part of the ad hoc industry-based "Transportation Advisory Council," met with Transport Canada's Policy and Coordination Group on the issue of substance testing. The railways again indicated their belief that legislation must contain some mechanism to facilitate testing for drugs and alcohol; the key test would be "for cause," but random testing should also be included if the cost would not be too burdensome.<sup>9</sup> The railways expect testing to have an overall positive effect in reducing substance use and promoting safety.<sup>10</sup>

In Committee consultations, as well as in research-related interviews, the major railways indicated that they consider the provisions of the *RS Act* to be inadequate and insufficient with respect to testing for substance use. CN, CP, VIA and the Railway Association of Canada (RAC) believe that the Act does not give them the legal authority to implement substance testing programs, particularly random testing. Sections 18–20 provide rules of "prohibition," but they are ambiguous on the issue of allowing regulations authorizing testing; some railways doubted whether the current wording would be strong enough to allow the required regulations to withstand a legal challenge. Railways want government to make it legally possible for them to undertake testing of employees working in safety-sensitive positions as a means of ensuring the safety of rail operations. In their opinion, without the legal authority to implement testing programs, railways would be left open to a legal challenge.

The Committee heard from three smaller railways (Algoma Central, the Cape Breton and Central Nova Scotia Railway, and the Southern Railway of B.C.) on this issue. One urged the development of criteria and penalties to enable the railway industry to manage the problem of substance use effectively. Another indicated that its short line would have no difficulty in complying with any requirement for substance testing. It was suggested that testing may be even more important to short line railways, given the potential for a major accident to bankrupt the organization.

The Committee found union representatives to be generally accepting of the necessity for substance testing in certain situations, but less convinced than the railways about the urgency for it. Testing in for-cause and post-accident situations was seen as justifiable, and some groups did not object to pre-employment testing. The Committee noted, however, that union support for certain testing was qualified in that they maintained that it must be conducted only as part of the overall EAP package. This is the same position that the unions took prior to the passage of the *RS Act*. Random testing was not supported by any unions the Committee encountered.



The Canadian Labour Congress remains opposed to substance testing, as it considers it to be an infringement on employees' rights.

A 1990 policy paper on alcohol and drug use by transport employees in all modes and the SCOT's review of this policy formed the basis for draft substance testing regulations produced in December 1992 by Transport Canada.<sup>11</sup> The current package of regulations would apply only to transportation employees (and supervisors) in safety-

sensitive positions and would cover a substance use prevention program (with compliance through guidelines, not regulations) and testing, among other things. Substance testing would have to be carried out by laboratories meeting specific standards and would be conducted at the following times: pre-placement; periodic (with medical); for cause; and

*In Committee consultations, as well as in research-related interviews, the major railways indicated that they consider the provisions of the RS Act to be inadequate and insufficient with respect to testing for substance use.*

follow-up testing (four tests over two years). Positive test verification would be carried out independently at the employee's expense. For-cause testing conditions were defined in the draft regulations, but, contrary to the wishes of the railways, random testing was not included. At the time this report was written, these draft regulations had not been adopted.

## SUBSTANCE TESTING PRACTICES IN OTHER JURISDICTIONS

Chemical testing programs for drug and alcohol use first appeared in the United States during the 1960s and early 1970s when the U.S. Department of Defense used urinalysis to screen military personnel returning from Vietnam. During the 1980s, an increasing number of U.S. companies started drug testing programs, following the development of more reliable technology, heightened awareness of the apparently high rates of drug use among certain segments of the population (especially military personnel) and federal initiatives promoting drug testing.<sup>12</sup>

It has been estimated that 50% of medium-sized and large U.S. businesses test current or prospective employees for drug use.<sup>13</sup>

Several major rail accidents in the United States during the 1980s were attributed to substance use. In 1982, a derailment at Livingston, Louisiana, and the subsequent release of hazardous materials because of improper operation of the train forced the evacuation of 2,700 residents.

The engineer and front brakeman were dismissed for alcohol intoxication. In 1984, five railroad workers died in Colorado when an apparently intoxicated engineer caused a head-on collision. Resulting damage was estimated at almost U.S.\$4 million.<sup>14</sup>

There were other accidents attributed to alcohol or drug use in the United States, the most shocking being an accident at Chase, Maryland, on January 4, 1987, in which Conrail locomotives passed a stop signal without authorization, placing them in the path of an oncoming Amtrak passenger train, travelling at more than 120 mph, en route from Washington, D.C. to New York City. The collision resulted in 16 fatalities (15 passengers and the Amtrak engineer), 174 injuries and U.S.\$17 million in property damage. The Conrail engineer and brakeman were found to have smoked marijuana in the cab of the lead locomotive approximately 30 minutes before the accident.<sup>15</sup>

In the United States, Federal Railroad Administration (FRA) regulations require railways to conduct random, pre-employment, return-to-service and follow-up drug-use testing, as well as testing where there is reasonable suspicion of use. Railways must submit their random testing programs to the FRA for approval. Regulations require railroads to conduct tests equivalent to 50% of their work force.<sup>16</sup> However, if the rate of positive tests is low enough, the required testing rate for the railway concerned may be lowered to 25%. Because of the costs involved and the low incidence of positive test results, the railroads would prefer the testing rate to be lowered to about 10%. Similar regulations for random alcohol testing are scheduled to come into force for Class I railways on January 1, 1995.

Only after the institution of drug-use testing in the American transportation system did the full extent of substance abuse as a safety problem become known. After the adoption of post-accident testing regulations, figures became available on the extent of drug and alcohol use in the railways, and the public and the industry were suddenly confronted with information indicating a connection between accidents and alcohol and drug use at a higher rate than expected.<sup>17</sup> An examination of U.S. post-accident test results indicates that drug use is a greater cause of rail accidents than is alcohol.<sup>18</sup>

It appears that the new regulation exposed a long-standing problem. In 1987, 156 railway accidents were selected for investigation. Twenty-three of these accidents were very serious, involving fatalities, injuries, released hazardous materials and/or extensive property damage.<sup>19</sup>

Drug and/or alcohol testing was carried out in 103 of the cases, and in 29 of these (19%) one or more employees were found to have used drugs and alcohol.

As shown in Table 8.1, since mandatory random drug testing came into effect in 1990, the number of employees testing positive has fallen each year (from 1% of total employees in 1990 to 0.7% in 1993). The incidence of drug use indicated in post-accident drug testing has also dropped — from 5.5% in 1987 to 2% in 1993. In the Committee's view, this provides strong evidence that random testing is effective in reducing drug use.

Table 8.1 FRA BACKGROUND DRUG TEST RESULTS						
<i>Positive test rates (%)</i>						
1987	1988	1989	1990	1991	1992	1993
<i>Post-accident</i>						
5.5	6.0	4.0	3.2	1.5	2.1	2.0
<i>Reasonable cause</i>						
6.6	5.4	3.5	1.9	1.9	1.9	1.9
<i>Random</i>						
—	—	—	1.0	0.9	0.8	0.7
Total no. of random tests:			35,228	50,436	42,599	42,199

Source: Data provided to the Railway Safety Act Review Committee by the U.S. Federal Railroad Administration, 1994.

In the United Kingdom, legislation passed in 1992 prohibits transportation staff from having drug or alcohol levels exceeding 80 mg/100 L. All employees are subject to this, and violations are a criminal offence. If an employee is found to have drug or alcohol levels between 30 mg/100 L and 80 mg/100 L, the employee is dismissed. There are also regulations relating specifically to the abuse of substances by transport employees in safety-sensitive positions.<sup>20</sup>

Germany has strict regulations for monitoring alcohol use, but not drug use. At present, the allowable level of alcohol is 80 mg/100 L, but some would like this lowered, given the zero tolerance that prevailed in the former East Germany. The government would like to define a way of measuring drug use, but there has been no accident resulting from such

use and the issue is therefore not considered pressing. Some insurance companies require the insured to pay for part of the damages if the driver is found to be under the influence of alcohol.

In France, alcohol and drug use are controlled primarily through a railway culture dating back to the nineteenth-century guilds: if you have a safety-sensitive job, you have to demonstrate that you have good habits. If employees do not demonstrate this, they can be penalized by forfeiting up to half their salary. Railways have their own medical department, in which doctors know their patients and can therefore detect problems during the required annual medical examination. Those results may be used in the dismissal of an employee.

Regulations on substance use in Australia vary from state to state. In New South Wales, any blood alcohol level above 20 mg/100 L is in breach of the law. Queensland operates with zero tolerance, but this is found to be impractical. The law provides for fines and imprisonment, and the company usually dismisses the employee involved. In Western Australia (Westrail), there is a medical examination for prospective employees as a preliminary screening process, followed by a program of age-based medical examinations during the term of employment. Medical practitioners test suspected cases, and there is an employee referral program for confirmed cases. Action taken for substance use ranges from counselling, reprimand, demotion, fines and suspension to dismissal.

The U.K. Health and Safety Directorate has no statistics on alcohol use, but there have been two serious alcohol-related railway accidents in Britain. Alcohol and drug use in the German rail industry are not viewed as a problem. France is reported to have no problem with drugs, while alcohol is somewhat more troublesome. Accidents or near-accidents in France, however, have rarely involved alcohol. Australia has a very low detection rate of substance use.

## SUBSTANCE TESTING IN CANADA

In spite of the limited availability of data in Canada, it is clear that drug testing programs are less prevalent than in the United States. In a 1990 survey of Canadian corporations by the Conference Board of Canada, only 14 of 97 responding organizations said they had substance testing programs in place.<sup>21</sup> Estimates from the Addiction Research Foundation (ARF), based on a representative sample of Ontario workplaces, indicated that only 4% of all companies had a drug testing program in 1993.<sup>22</sup>



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Private-sector programs in Canada differ slightly from one another, reflecting the specific needs and concerns of the companies. Perhaps the most detailed and all-inclusive program is that operated by Imperial Oil. The program, which began in January 1992, includes pre-employment testing, post-incident testing, for-cause testing and, at least once a year, random testing of approximately 850 individuals in both designated safety-sensitive and executive positions. Testing includes urine tests for drugs and breathalyzer tests to detect the presence of alcohol. Approximately 2,000 tests a year are conducted, with 0.4% of the samples testing positive for prohibited substances.<sup>23</sup>

In the federally regulated sector, the Toronto-Dominion Bank operates a pre-employment drug testing program. A Tribunal of the Canadian Human Rights Commission recently conducted a hearing on this program to determine if it violates the *Canadian Human Rights Act* prohibition on discrimination on the basis of "disability." The Tribunal found the bank's testing to be invasive, but legal.

The Department of National Defence (DND) introduced a drug testing program, *Operation Cascade II*, in 1992 to encompass for-cause testing, control testing (random testing of those previously found to be using substances), post-incident/accident testing and "blind" testing. The "blind" testing component is conducted for data purposes only. The information obtained will be used to determine the need for and type of additional testing. In the past year, one sweep of random "blind" testing was done: 5,000 military personnel were tested and a positive rate of 3.3% was found.<sup>24</sup> DND does not conduct testing for alcohol use. To date, there has been no legal challenge of this program.

Within the transportation sector, a 1989 survey conducted by the ARF for Transport Canada found that only 19.5% of federally regulated transportation companies (mainly in the rail, aviation and marine industries) had any kind of drug testing. Another 25% of these companies expressed an interest in establishing a testing program.<sup>25</sup>



The Committee also learned in the course of its research that some trucking companies in Ontario test their employees for drug use.

In Canada, as noted above, with the exception of pre-employment situations, there is currently no testing of rail employees unless there is a fatal accident in a safety-sensitive position or reinstatement following a Rule G violation. The Class I railway companies have EAPs in place to address a variety of problems that may affect employees in the workplace, including substance abuse and addiction. CN has noted a rise in the number of employees who turn to the EAP for substance-related reasons since it reintroduced anonymity and confidentiality to the program.

Rule G of the recent Canadian Rail Operating Rules prohibits the use of intoxicants or narcotics by employees on duty or on call, or their possession or use while on duty. The use of medication prescribed by physicians that in any way adversely affects the employee's ability to work safely is also prohibited; therefore, employees must know the side-effects of any medication they take.

CN's and CP's positions on violations of Rule G differ. For CP, self-referrals or referrals by supervisors may go to EAPs for rehabilitation; however, a violation of Rule G results in a disciplinary process that can lead to dismissal. For CN, Rule G violators are allowed to enter the EAP rather than face dismissal.<sup>26</sup>

EAPs are offered by all the Canadian Class I railway companies. These programs handle cases of substance abuse through counselling and education and may operate prevention campaigns. They also deal with other personal and work-related employee problems. EAPs are developed by the companies and unions together. At CN, for example, the presidents of the five signatory unions and five company executives meet as partners twice a year to look at the program. The programs generally guarantee anonymity, so that employees are not afraid to enter the program, and they operate at the regional level. The Committee did not examine the extent to which short line or smaller railways operate EAPs.



## THE CASE FOR TESTING

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### The Legal Considerations

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At first glance, the decision to introduce a substance use testing program is not a legal one. Only the companies involved can know if there is a pressing and substantial problem. If a problem exists, then a substance testing program can be developed that will likely withstand challenges under both the *Canadian Charter of Rights and Freedoms* and the *Canadian Human Rights Act*. Although testing infringes at one level on the individual rights protected by this legislation, the Committee's view is that the threat to the public good posed by substance use on the part of those in safety-sensitive positions is most likely sufficient to merit and permit testing. The issue is how broad that testing program can be before it infringes too greatly on individual rights. For example, a program restricted to testing people in safety-sensitive positions who show obvious signs of impairment would in all likelihood withstand challenge. But if the policy objective were to ensure safety for employees and the public at large, a universal testing program of all employees, regardless of their job, would probably contravene prevailing legislation.

Committee research indicates that for-cause testing would in all probability survive both a constitutional and a *Canadian Human Rights Act* challenge. It could include testing in circumstances where there is a reasonable belief, based on observed facts, that a person is impaired to a level that affects job performance and where there are reasonable grounds to believe that a person may have a drug or alcohol addiction.

Testing as a condition of reinstatement and rehabilitation would also probably survive a constitutional and a *Canadian Human Rights Act* challenge.

Post-incident testing would survive a legal challenge if it were appropriately limited — for example, to situations where human act or omission cannot be ruled out as a contributing cause. A well-defined policy would need to be developed to ensure objectivity.

Pre-employment testing is more controversial. A very clear rationale for such a policy would be required to make it constitutional. For example, it might be appropriate for safety-sensitive jobs, since a positive test during a scheduled examination could be an indicator of an addiction.

The constitutionality and legality of random testing are not entirely predictable. The Canadian Human Rights Commission is on record as opposing such legislation.<sup>27</sup> To ensure constitutionality, random testing would have to be restricted to persons in safety-sensitive positions. As well, companies would have to establish that:

- a problem exists in the industry;
- identifying persons with substance abuse problems is difficult and random testing would assist in this endeavour;
- a random testing program would deter employees from using intoxicating substances shortly before or during working hours;
- the test results are accurate; and
- the consequences of a positive test are fair and rational.

## Conclusions

The Committee concludes that substance use, particularly alcohol consumption, by railway employees in safety-sensitive positions is a matter of

*In Canada, with the exception of pre-employment situations, there is currently no testing of rail employees unless there is a fatal accident in a safety-sensitive position or reinstatement following a Rule G violation. The Class I railway companies have EAPs in place to address a variety of problems that may affect employees in the workplace, including substance abuse and addiction. CN has noted a rise in the number of employees who turn to the EAP for substance-related reasons since it reintroduced anonymity and confidentiality to the program.*

concern. Data on the incidence of substance use are limited to the Transport Canada survey of 1987, the railways' pre-employment figures and information from the United States. The Committee believes it important that additional research be conducted to determine the scope of the problem. It would be most regrettable if the issue of substance use by Canadian railway employees came to a head only after a tragic rail accident resulting from substance use. It happened in the United States, and no one wants to see it happen in Canada.

The Committee's legal research suggests that a testing regime conducted in the context of an overall

program and developed properly to address the criteria previously discussed could withstand legal challenges. Other organizations in Canada have successfully established testing programs, including random testing at Imperial Oil and DND.

Testing programs should be considered only in the context of a comprehensive package that includes employee education, clear policies

on substance use, prevention campaigns, supervisory training and EAPs. EAPs should provide confidential, professional help to employees troubled by any problem that might affect work performance. Confidentiality, without the threat of job loss, encourages the employee to take the initiative in addressing the problem.

Without such a comprehensive program, testing by itself would be less effective and perhaps leave the program open to legal challenges. As noted, all the Class I railways have EAPs in place that appear to offer all the services mentioned above to those referred to them.

Alcohol testing should be included in the program, because Canadian studies suggest that alcohol abuse is much more prevalent than drug abuse.

Any testing must adhere to standards of quality. It would be important, for example, to establish standards for the reporting of results and for ensuring the confidentiality of those results. Some means should be available for employees to obtain independent verification of test results.

Collectively, these principles outline a program that is sensitive to the individual's right to privacy, but that also addresses the public's concern about ensuring safety in the rail industry.

The Committee believes that it should be up to the railways themselves to evaluate and decide whether a testing regime is required, determine what it would include and then develop a program based on these considerations. However, if the railways deemed it to be in the interests of both railway and public safety to proceed with testing under the rules process (Section 20), they should be able to do so.

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## RECOMMENDATION 8.1

**We recommend that Section 18(1)(c)(iv) of the *Railway Safety Act* be amended so as to clearly give authority to the railways to implement a substance use testing program for employees in safety-sensitive positions. Such testing programs should be in the context of the overall programs of employee counselling and education.**

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## RECOMMENDATION 8.2

**We recommend that substance use be studied in order to determine the extent of the problem. Any existing programs should be adjusted to reflect the results of the study.**

A railway system that is substance-free, particularly in the case of those employees holding safety-sensitive positions, is in the interests of railway employees, the public and the railway companies. The Committee believes that drug and alcohol testing will drastically reduce the chance of a railway accident caused by substance use.

## NOTES

1. Task Force on the Control of Drug and Alcohol Abuse in the Railway Industry: Survey of Persons Employed in Positions Critical to Railway Safety, *Final Report*, October 1987.
2. *Ibid.*, pp. 14, 15.
3. *Ibid.*, pp. 18, 19.
4. *Ibid.*, p. 22.
5. Standing Committee on Transport, February 25, 1988, 50:9, 50:44.
6. *RS Act*, Section 18(1)(c)(iv).
7. Employees are first tested for alcohol use, then drug use; a failure on the first test terminates the process, and there is no need to test for drug use. Figures were obtained through interviews with railways.
8. This figure on EAPs marks an increase over previous years, which might be due to a better EAP. For CN, the figure is in the hundreds. Figures were obtained through interviews with railway officials.
9. Pearmain Partners, "Issues in Substance Testing in Canadian and U.S. Railways," Report prepared for the Railway Safety Act Review Committee, August 1994, p. 32.
10. Representatives from other modes had differing points of view. The airlines do not see evidence of a drug use problem and are concerned by the cost of any required testing program. Truckers who rely on north-south trade are keen on testing regulations to better ensure that drivers will satisfy American regulations.

11. *Strategy on Substance Use in Safety-Sensitive Positions in Canadian Transportation*, Transport Canada, March 1990; Standing Committee on Transport, *Third Report*, tabled June 12, 1990; *Substance Use in Safety-Sensitive Positions in Canadian Transportation: Government Response to the Third Report of the Standing Committee on Transport*, Transport Canada, November 7, 1990.
12. Pearmain Partners, *op. cit.*, p. 12.
13. K. Gilliland and R.E. Schlegel, *Readiness to Perform Testing: A Critical Analysis of the Concept and Current Practices*, Report prepared for the U.S. Department of Transportation, Federal Aviation Administration, August 1993, p. 1.
14. G.C. Cothen, Jr. and R. Shamberger, "Substance Abuse Countermeasures for the Railroad Industry," *Alcohol, Drugs and Driving*, Vol 8, No. 3-4 (1992), p. 245.
15. *Ibid.*
16. *Code of Federal Regulations*, Transportation, 49, Parts 200-399, Revised as of October 1, 1992, pp. 140-41.
17. G.C. Cothen and R. Shamberger, *op. cit.*, p. 255.
18. In the general population, alcohol use is lower in the United States than in Canada — 68% vs. 78% — and drug use is higher in the United States — for marijuana, 9.6% (U.S.) vs. 6.5% (Can.); for cocaine, 3.1% vs. 1.4%. *Alcohol and Other Drug Use by Canadians: A National Alcohol and Other Drugs Survey (1989)*, Report prepared for Health and Welfare Canada, June 1992; and U.S. *National Household Survey on Drug Abuse: Main Findings, 1990*, U.S. Department of Health and Human Services, 1991.
19. B.M. Sweedler, "Alcohol and Other Drug Use in the Railroad, Aviation, Marine and Trucking Industries — Progress Has Been Made," Paper presented to the 12th International Conference on Alcohol, Drugs and Traffic Safety, Cologne, Germany, September 28-October 2, 1992, p. 3.
20. Information on the United Kingdom, Germany, France and Australia is from interviews with relevant officials in those countries.
21. The Conference Board of Canada, *Corporate Responses to Substance Abuse in the Workplace*, Report 87-92, p. 18.
22. S. Macdonald and S. Wells, "Employee Assistance, Health Promotion and Drug Testing Programs at Ontario Work Sites," 1993 Provincial Survey of Workplace Programs, Addiction Research Foundation, July 1993, p. ii.
23. Wolch, Pinx, Tapper, Scurfield, "Substance Use Testing in the Workplace," Report prepared for the Railway Safety Act Review Committee, 1994, p. 1.
24. Department of National Defence, *Operation Cascade II: An Anonymous Urinalysis Drug Survey Conducted Across the Canadian Forces*, 8 December 1992, February 25, 1993.
25. S. Macdonald and S. Dooley, "The Nature and Extent of EAPs and Drug/Alcohol Testing Programs in the Transportation Worksector," Addiction Research Foundation, 1989.
26. Pearmain Partners, *op. cit.*, pp. 33-34.
27. Wolch, Pinx, Tapper, Scurfield, *op. cit.*, p. 16.



## PROVINCIALY REGULATED RAILWAYS

*It is evident that all the provinces rely on federally developed regulations to serve as the basis of their safety regime.*



### INTRODUCTION

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Thus far, this review of railway safety legislation has dealt primarily with issues germane to “federal railways.” It stands to reason that the prominent, well-known railways — CN, CP and VIA Rail — not only account for the lion’s share of railway traffic in this country, but also are the subject of most of the federal railway safety regulation effort. There also exists another group of much smaller railways<sup>1</sup> that, for a variety of reasons, have come under federal regulation. The purpose of this chapter is to deal with yet another group of railways — those that fall under provincial jurisdiction.

Railways, regardless of length, that are located wholly within a province and that have not been declared to be works for the general advantage of Canada are subject to the legislation of the province in which they are located.

Federal and provincial legislation were very similar at the turn of the century, largely mirroring the British *Railway Act* (c.1850) and using roughly the same wording as in the federal “master Act.” Other than empowering inspectors, the old Acts included few details relating to safety. By the early 1920s, over 220 provincially and federally chartered railways had been amalgamated into Canadian National Railways and, before long, almost all rail lines in Canada had become part of either CN’s or CP’s system. Consequently, over 90% of railway miles in Canada fell under the jurisdiction of the federal government, making most provincial railway Acts redundant.

### CATEGORIES OF PROVINCIAL RAILWAYS

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A category of provincial railway often referred to as “short lines” has been the subject of much public attention and substantial provincial government legislative and regulatory energy, often due to their recent



entry into the industry. Industrial spur lines, commuter rail and rapid transit systems, and recreational railways are a source of jurisdictional confusion and will also be dealt with in this chapter.

## PROVINCIAL APPROACHES TO THE REGULATION OF RAILWAY SAFETY

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### Short Lines (Common Carrier Freight Railways)

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There has been renewed interest in the establishment of local/regional/provincial freight-oriented railways as an alternative to outright abandonment of certain CN and CP lines. When these railways — generally referred to as “short lines” — are created and are located wholly within a province, regulatory jurisdiction is transferred from the federal government to the relevant provincial government (see Table 9.1). Short lines currently operate in eight provinces: British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick and Nova Scotia.

British Columbia is the province with the longest continuous involvement in regulating provincial railways and the only province to keep comprehensive statistics on rail safety. Although the number of short lines is not large, most provincial railway Acts have been modernized to address safety matters (see Table 9.2). Some provinces with legislation have yet to pass regulations.

Alberta, Nova Scotia and Ontario have Memoranda of Understanding (MOUs) with Transport Canada for inspection services for all or specified provincial railways. A fee is paid for these services.

Ontario provides an example of the potential for confusion in the regulation of provincial railways. The Ontario Northland Railway (ONR), previously regulated by the federal government, has the powers and rights of railways conferred by the *Ontario Railways Act* as a result of the *Ontario Northland Transportation Commission Act* of 1970, but in any other respects no Act applies. The ONR follows federal railway safety and operating standards but essentially is self-regulating; if an accident occurs on the ONR, the ONR investigates the accident itself. Under federal law, Transport Canada does regulate a short segment of the ONR (Nipissing Central), which crosses the Ontario–Quebec border.

The Goderich and Exeter Railway (GEXR) is a short line that operates on some recently transferred CN branch lines.

**Table 9.1**  
**CHARACTERISTICS OF SELECTED PROVINCIAL (SHORT LINE) RAILWAYS**  
*Source: Transport Canada*

Jurisdiction/railway	Miles (km) of track	Public crossings	Other crossings	Locomotives	Employees
CANADA: All federal railways combined	44,000 (70,400)	23,000	25,000	3,400	60,000
BRITISH COLUMBIA: B.C. Rail Southern Railway of B.C.	1,744 (2,806) 141 (226)	387 221	498 66	120 19	2,300 182
ALBERTA: Central Western Railway	230 (370)	190	110	4	20
SASKATCHEWAN: Southern Rails Co-op	45 (72)	20	20	1	6
ONTARIO: Goderich and Exeter	70 (112)	80	126	4	8
QUEBEC: Roberval and Saguenay Railway Chemin de fer Cartier Chemin de fer de la Rivière Romaine Chemin de fer de Matane et du Golfe Chemin de fer Lanaudière Inc. Quebec Railway*	100 (160) 240 (386) 20 (32) 34 (54) 10 (16) 88 (141)	25 U U U U U	100 U U U U U	11 U U U U 3	170 U U U U 12
NOVA SCOTIA: Cape Breton and Central N.S. Windsor and Hantsport*	250 (402) 88 (141)	170 U	280 U	12 8	45 26

Note:

U = Unknown.

\* = Proposed.

Source: E.M. Ludwick & Associates Inc.

Table 9.2  
THE PROVINCIAL RAILWAY LEGISLATION SITUATION

Province	Legislation (date passed)	No. of railways* (current/ proposed)	Types of railways covered:				Recreational:		MOU with TC
			Short lines	Spur lines	Rapid transit	Standard	Mini		
Nova Scotia	<i>An Act Respecting Railways</i> (1993 — TC regs.)	1/1	✓	n.a.	N/A	n.a.	No	✓	
New Brunswick	<i>Short Line Railways Act</i> (1994 — no regs.)	0/1	✓	n.a.	N/A	✓	No	Pending	
Quebec	<i>Act to Ensure Safety in Guided Land Transport</i> (1988 — no regs.)	6/1	✓	✓	✓	✓	No	No	
Ontario	<i>Railways Act</i> (1906 + special Acts — TC regs.)	3/?	✓	No	No	✓	No	✓	
Manitoba	<i>Provincial Railways Act</i> (1993 — no regs.)	0/1	✓	n.a.	N/A	✓	n.a.	Pending	
Saskatchewan	<i>Railway Act</i> (1989 — no regs.)	1/0	✓	✓	N/A	✓	No	No	
Alberta	<i>Railway Act</i> (1907 + special Acts — TC regs.)	2/0	✓	No	No	✓	No	✓	
British Columbia	<i>Railway Act</i> (1979 — B.C. regs.)	13/0	✓	✓	✓	✓	✓	No	

Notes:

\* Does not include industrial spur lines.

Regs. = regulations.

TC = Transport Canada.

N/A = not applicable (no rapid transit).

n.a. = not available.

Source: E.M. Ludwick & Associates Inc.

The regulatory authority in Ontario is the Ontario Municipal Board (OMB), which contracts with Transport Canada for inspection services. Any organization (except the ONR) wishing to operate a railway in Ontario must be incorporated by way of a special Act of the Ontario legislature *and* be authorized by an order of the OMB. It is through this special Act that any archaic provisions of the *Railways Act* can be circumvented by the introduction of clauses that commit the railway to special undertakings.

In its consultations, the Committee was informed that one railway was carrying freight on its line, even though it was authorized by the OMB to run only a recreational sightseeing service. The Committee was further informed that the same railway, for a period of time, was unable to provide the insurance coverage required by the OMB's order, meaning that it ran in contravention of the order. This particular situation underscores the need for provinces to have in place adequate legislative, regulatory and enforcement frameworks to ensure the safety of railways.

## Industrial Spur Lines

Industrial spurs connect factories, mines, mills, etc. with main or branch lines. The question of which of these lines fall under federal or provincial control is the subject of ongoing debate and, in the meantime, a regulatory vacuum prevails. Over 200 industrial spurs are thought to exist in Canada. Some of the companies that own spurs operate their own locomotive power equipment, while others rely on CN or CP to switch cars on and off their lines.

Although industries that operate their own railways usually cooperate with provincial authorities, jurisdictional authority is unclear, and provinces have expressed concern.

British Columbia, which has always regulated what now amount to more than 60 industrial spurs, has sought to correct unsafe situations on federal railways where it has no legal authority. It has used interchange agreements to indirectly get CN and CP to make repairs to the track by ordering the owner of a spur to make the repair.<sup>2</sup> Quebec law includes railway spurs and applies to 90 firms that operate locomotives or trackmobiles as part of their industrial processes, because studies have shown that these lines experience the greatest incidence of accidents.

## Commuter Rail and Transit Systems

Municipal rapid transit systems exist in five Canadian cities to meet the daily challenge of transporting people (see Table 9.3). Although they are few in number, there is little uniformity in the way in which and under whose authority their safety is governed.

There is, however, a forum for the exchange of various ideas regarding safety challenges and solutions: each of the urban transit properties participates in the American Public Transit Association's Safety Committee. Otherwise, the lack of uniformity/clarity of approach is striking.

<b>Table 9.3</b> <b>URBAN GUIDED GROUND PASSENGER</b> <b>TRANSPORTATION SYSTEMS</b>		
<b>System name</b>	<b>No. of miles (km)</b>	<b>Estimated annual ridership (millions)</b>
<b>Urban Rapid Transit Systems:</b>		
Vancouver Skytrain	14.4 (23.04)	36.0
Calgary C-Train	17.4 (27.84)	31.2
Edmonton LRT	7.4 (11.84)	10.4
Toronto Subway	95.0 (152.0)	153.0
Montreal Metro	36.5 (58.4)	196.9
<b>Suburban Commuter Systems:</b>		
Toronto GO Train	224.0 (358.4)	25.9
Montreal Suburban Trains	43.8 (70.08)	8.7

Source: Direct inquiry, Summer 1994.

## Recreational Railways

A continuing nostalgia for the romance of the railway age has spurred the establishment of passenger-carrying, tourism-oriented railways across the nation. This fascination with railways is manifested in the large number of recreational railways, railway museums and parks featuring retired railway equipment. Table 9.4 shows the distribution of 46 recreational railways currently operating in Canada. These kinds of railways fall into two categories: standard gauge full-size train operations and miniature/narrow gauge train amusement rides. There are about a dozen of the former and at least 34 of the latter across Canada.

**Table 9.4**  
**RECREATIONAL RAILWAYS, BY PROVINCE**

<b>Province</b>	<b>No. of standard gauge</b>	<b>No. of narrow and miniature gauge</b>
British Columbia	2	8
Alberta	4	4
Saskatchewan	—	2
Manitoba	1	3
Ontario	2	9
Quebec	2	2
New Brunswick	1	2
Nova Scotia	—	2
Prince Edward Island	—	1
Newfoundland	—	1
<b>Total</b>	<b>12</b>	<b>34</b>
<b>Estimated annual ridership</b>	<b>531,500</b>	<b>2,216,000</b>

*Source:* Direct inquiry, September 1994.

British Columbia is the only province formally regulating and inspecting recreational railways through provincial railway law. Other provinces regulate (or do not regulate) these railways in a variety of ways. Most are inspected by provincial labour officials or covered by occupational health and safety law. The Toronto Zoo monorail, which is owned and operated by a municipal government, is self-regulating and subject to no authority other than occupational health and safety law. Interprovincial inconsistencies in the regulation of recreational railways from a safety perspective invite attention. Though the majority of these railways do not cross public roads or travel at high speeds, some have equipment or operate in a manner normally covered by the accepted body of railway regulations. Some have the more alarming feature of being surrounded by wandering tourists (park visitors), who in other circumstances would be viewed as trespassers on railway property.



## SPECIAL FEDERAL—PROVINCIAL RAILWAY SAFETY ISSUES

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### Provincial vs. Federal Responsibility

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The *National Transportation Act, 1987* (NTA, 1987) introduced the possibility of conveying a railway line as an alternative to abandonment. These new railways are generally referred to as “short line railways.”

As mentioned in Chapter 4, where part of a railway line being conveyed is situated wholly within the limits of a province and no passenger service is provided on the line by VIA Rail, the line becomes subject to the legislative authority of the province.<sup>3</sup> This unanticipated re-entry of railways into the provincial domain may explain the diversity of provincial approaches to railway safety regulation. In 1987, many provinces had no current legislation dealing with railways.

Provinces had to establish or revamp the necessary legislation or find some alternate means to deal with the situation. In the process, as many as five provinces have turned, or plan to turn, to the federal government for inspection services.

Industrial spurs also pose a threat to safety. Every province has expressed concern about this area of confusion. The debate is most advanced in British Columbia, where a number of industrial railways have questioned the traditional inspection authority of the province.

This situation clearly requires a solution to be worked out between the federal government and the provinces.

### The Efficiency of Regulation

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Governments and the industries they regulate are concerned with the efficiency of regulation. Regulation should be undertaken at a reasonable cost, using qualified experts and avoiding duplication of effort within and between governments. The present state of provincial railway regulation should not be mistaken for an illustration of regulatory efficiency. With the exception of British Columbia, which has continuously maintained railway law, regulation and inspection expertise throughout the century, provinces of late have had to make some sizeable investments of time, effort and money to organize themselves to be railway regulators once again. Significant resources are for the most part devoted to the regulation of only one or two short lines.

Nova Scotia subjects its short lines to the body of federal safety regulations by referring to these in each railway's licence or operating certificate, as does the OMB. In Manitoba, work is in progress on safety regulations, to be based on the federal framework. Quebec is expected to take three years to develop a set of regulations that essentially should approximate to the body of federal safety regulations.

British Columbia is equipped with modern law, and a regulatory regime is set up to mirror the old Canadian Transport Commission (CTC) safety programs. Alberta has yet to modernize its legislation and regulations. Substantial resources are devoted to the regulation of one short line and to the administration of an inspection contract that the province has with Transport Canada. Saskatchewan experienced an initial period of intensive legislative development activity, but the formulation of a basic set of made-in-Saskatchewan regulations has fallen somewhat on the provincial priority list.

It is evident that all the provinces rely on federally developed regulations to serve as the basis of their safety regime. In some cases, this dependence extends to inspection of provincial railways and enforced compliance with federal regulations. Given the increasingly linked North American railway market, there will be a growing incentive for provinces to harmonize with the federal scheme.

### The Inspection of Provincial Railways by Federal Inspectors

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Reliance upon federal regulations and inspectors notwithstanding, both provincial railways and the provinces that regulate them have reservations about federal inspectors' approach to short lines. Transport Canada inspectors are often used because there is an insufficient volume of activity for a province to perform its own inspections. The Committee has heard from provinces and provincial railways, however, that these inspectors are often overly harsh and inflexible, requiring the same standards of short line railways as they do of federal railways when it is inappropriate to do so.

One example brought to the Committee's attention was related to track standards. A short line operator, running a low-speed operation on vintage track, was told by a federal inspector that it would be necessary to upgrade all track to federal main line specifications, even though the track was satisfactory for the type of operation being conducted. The operator prevailed through ensuing discussions; otherwise, it would have had to shut down the line.

Transport Canada is simultaneously acknowledged for its technical expertise and disparaged as having no familiarity with or practical knowledge of short line operations.

Two short line operators in two different provinces cited cases in which the Transport Canada inspector told each of the railways to upgrade all their crossing signals; the inspector admitted that there was nothing wrong with the signals, but modern technology was better. Compliance would have imposed great cost on the railways and on the municipalities, which must cost-share crossing improvements. In both cases, the provincial regulators did not turn

*It is evident that all the provinces rely on federally developed regulations to serve as the basis of their safety regime. In some cases, this dependence extends to inspection of provincial railways and enforced compliance with federal regulations. Given the increasingly linked North American railway market, there will be a growing incentive for provinces to harmonize with the federal scheme.*

Transport Canada's recommendations into orders, largely on economic grounds.

The overall conclusion to be drawn from these criticisms is that, to inspect provincial railways credibly, Transport Canada's inspectors must become more flexible, multi-disciplinary generalists.

## THE NEED FOR A NEW FEDERAL-PROVINCIAL RAIL SAFETY REGULATORY REGIME

### Provincial Railways' Desire for More Practical Regulation

Provincial railway operators all claim to want to follow accepted North American standards. This desire is tempered by the need for regulatory recognition that short line operations differ from main line operations. They are restricted to relatively low branch line speeds that allow more reaction time. Most enjoy reasonably good track conditions. As locally based operations, they maintain awareness of local vehicular traffic patterns and peak periods. They are constantly investing in their capital plant, helping to reduce the frequency and severity of incidents. Most importantly, Canada's short line operators are usually quick to identify and correct any potentially dangerous conditions without waiting for orders from the regulator.

The provincial railways presently in operation all appear to have satisfactory safety records. All claim strict adherence to applicable Association of American Railroads (AAR) rules, which constitute the body

of railway safety standards accepted throughout North America. They have in place a detailed set of operating rules, training and a system of regular examinations and recertification to ensure the competence of employees. Further, some short lines use innovative management approaches to achieve the required safety results, including the use of financial incentives and penalties to acknowledge productivity and safety.

Canada's short line railway operators hold a wide variety of opinions as to what constitutes an ideal rail safety regime. Some suggested there is nothing to discuss in that any short line railway wishing to interchange traffic with a federal railway must respect national/federal standards. A number of operators expressed the view that a single regime of railway regulations featuring the highest possible standards should be equally applicable to all railways across Canada. While some supported one set of regulations and one (federal) regulator, many felt that a national body of rules should be enforced by each province.

Several operators suggested a regulatory regime whose strictures would vary in accordance with speed and/or type of operation. One company expressed the need for a set of base rules for all railways; an individual railway would be expected to adopt the base rules or apply for an exemption from the parts that are inapplicable and be prepared to justify any exemptions. Yet another opinion (drawing on the requirements of the U.S. Federal Railroad Administration) was that railways should be required to develop and adhere to their own operating rule book following generally accepted standards. This view was elaborated upon by a company that pointed out the importance of understanding the physical nature of the property and the need to inspect in accordance with the customized standards set for that particular property or asset.

Other views concerning an ideal rail safety regime included the need for all railways to be subject to the same rules regarding behaviour at crossings. Finally, reflecting on the fact that most provinces are regulating railways without the benefit of proclaimed regulations, one company pointed out that regulations should be written down and short line operators should adhere to them, since verbal agreements between provincial regulators and their railways to operate in conformity with federal rail safety standards would not stand up in court.

### The Need for a Centralized, Multi-Tiered Regulatory Structure

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That there is a lack of clarity and consistency in these approaches to regulating railway safety is quite evident. There appears to be substantial room for improvement in the relations between provincial railways,



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their provincial regulators and contracted Transport Canada inspectors. Indeed, the Committee suggests that a whole new regime would be appropriate.

It was pointed out by several provinces that a guiding theme in the development of their legislation was that it should mirror federal safety law as much as possible — that is, since provincial railways must interface constantly with the national railways, the safety rules that govern them should be common. If all provincial regulatory regimes mirror the federal regime, then they must mirror each other and, if they are all essentially similar, the need for nine separate regulatory structures is not obvious. In the interests of efficiency and consistency across the country, therefore, the idea of regulating provincial railways centrally using special teams of experts knowledgeable about the different kinds of railway operations is appealing. Whatever administrative structure is chosen, one approach could be to develop a set of national safety rules with exceptions designed to produce a safety program that more closely reflects differences in type of operation than geo-political barriers. Another approach would be to have every railway prepare its own safety plan using a set of nationally accepted and published standards as a guide and incorporating the railway's geographic and operational peculiarities.

An improved central regime featuring a common base of safety principles and macro-standards across the country would be beneficial, particularly to entrepreneurs considering operations in more than one province. There would also be scope for the provinces, federal government and all types of railways to work together to develop an environment and structures conducive to regulatory harmony with respect to safety. Provinces that are not yet equipped to meet the safety regulation challenge independently and cost-effectively would find relief. Such a regime would even prove beneficial to those provinces that wish to continue their historical role in safety regulation or that are eager to tackle new responsibilities in this area but recognize the merits of collaboration between regulators to harmonize railway safety regulation. After



all, the goal should be to secure the safety of the general public and railway operators while minimizing the regulatory burden on carriers.

Although provincial railway operators have some criticisms of the current Transport Canada role (through MOUs), they agree that the present fragmented approach to regulating provincial railways is more an annoyance than an impediment. Fully cognizant of the provincial right and responsibility in the area of economic regulation, they see benefits to a centralized system of safety regulation. Specifically, provincial railways have pointed out that:

- uniformity and consistency of standards and regulations across Canada are desirable;
- experienced inspectors would be preferable to untrained provincial people who may be unsure of railway operations and safety tolerances;
- while the inspection of short line railways to the same standards as CN and CP helps ensure conformity with the AAR interchange rules, Transport Canada inspectors and the standards they use should acknowledge that differences in railways operations and equipment exist between companies;
- provincial regulators should not be acting independently or in isolation from recognized standards and new developments in the railway world; and
- provinces not wishing to devote the necessary resources or attention to their in-province railways should contract with the federal government to regulate on their behalf.

### Placing a Greater Onus for Safety Assurance on Railways

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A number of provinces believe that railways should be assigned more responsibility for ensuring public and employee safety. Indeed, railways have already cooperated as an industry and developed strict rules governing the interchange of cars between any two railways in North America. A short line railway wishing to connect with another railway must receive a certificate from the AAR declaring that the short line operator agrees to adhere to certain requirements.<sup>4</sup> If a provincial (or any) railway wants to do business with other railways, its operators must prove they can be trusted to operate in a safe manner.

Several provinces have incorporated into their regulatory system the concept of having the railways take on greater responsibility for the tasks and costs of safety compliance.



Some provinces note that, ideally, railways could provide the regulator with a safety plan, which the regulator would approve, thereafter allowing provincial line railways to manage their own affairs. Such a regime could involve monitoring, periodic audits and inspections for compliance. The Committee believes that such an approach fits with its model for the reform of federal rail safety regulation.

Provinces and provincially regulated railways consider that a national organization such as the Railway Association of Canada (RAC) could help develop a standard set of regulations that could be adopted as required by any province and used by any railway in developing its own specific safety plan and operating rules. The RAC could help develop an information package for prospective short line operators, and develop and communicate safety standards applicable to railways of all kinds.

The representatives of both short line and Class I railways agree that the RAC could provide a forum for making the expertise that resides in the larger railways available to the smaller railways. Small railways should not have to follow all the regulations uniformly if some of the aspects do not apply to them. A “short lines committee” of the RAC could also provide opportunities for short line railways to share information among themselves.

## CONCLUSIONS AND RECOMMENDATIONS

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The Committee has found that there are varying levels of preparedness for the safety regulation of short lines among provincial railway regulators. Fortunately, it believes that there are ways to overcome these difficulties.

The program it has recommended, which allows for the development of safety programs by railways in accordance with performance standards, would essentially move Canada to a multi-tiered system of safety regulation. The Committee would suggest that this scheme be applied to regulating provincial railways.

In the longer term, the Committee believes that the program it has outlined, combining a less prescriptive approach through macro performance standards on the part of the regulator and requiring the submission of a safety program from railways, has the requisite features to allow it to be applied federally and provincially. The role of the regulator, to be performed by Transport Canada, would also apply on a

provincial level. For short lines, the cooperation and assistance of the RAC would be necessary to determine minimum standards for differing classes of railways and to help in the preparation of their safety programs.

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### **RECOMMENDATION 9.1**

**We recommend that provinces without proclaimed legislation and regulation be encouraged to implement their own legislative plan compatible with the federal regime or sign a comprehensive agreement with Transport Canada to perform the inspection, monitoring and auditing of railways within provincial jurisdiction on their behalf.**

### **RECOMMENDATION 9.2**

**We recommend that Transport Canada take into account the specific attributes of each class of railway in any agreements with provinces for the inspection of provincial railways.**

### **RECOMMENDATION 9.3**

**We recommend a joint federal–provincial effort to clarify the regulatory jurisdiction over industrial spurs.**

### **RECOMMENDATION 9.4**

**We recommend that Transport Canada seek agreements with the provinces to establish a national, coordinated regulatory system for railway safety following the implementation of this Committee's regulatory program.**

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It appears that the railway industry is changing and that short lines will be a larger element of the industry. To accommodate them in the future is a challenge that government must react to quickly.

## NOTES

1. Among others, these include: Algoma Central Railway, Arnaud Railway, Devco Railway, Essex Terminal Railway, the Nipissing Central portion of the Ontario Northland Railway, Quebec North Shore and Labrador Railway, Shawinigan Falls Terminal Railway, Wabush Lake Railway and the Canadian extensions of several major American railways.
2. E.M. Ludwick & Associates Inc., "Inter-Governmental Issues," Report prepared for the Railway Safety Act Review Committee, July 1994, p. 25.
3. Section 158 of the *National Transportation Act, 1987*.
4. E.M. Ludwick & Associates Inc., *op. cit.*, p. 64.

## SAFETY IN THE FUTURE

*The rail industry is one  
in which rapid changes  
are occurring.*



Having reviewed the evolution of the current system and the changing railway industry culture, we will now address the future regulatory environment. What structural and technological changes are in store for the railway industry, and what are the implications for the *Railway Safety Act (RS Act)*?

### THE RESTRUCTURING OF THE RAILWAY INDUSTRY

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The rail industry is one in which rapid changes are occurring. While the Committee's work has been in progress, various structural changes have been under discussion that could alter the future configuration of rail in central and eastern Canada. A discussion about the future of rail safety would be incomplete without a look at such potential changes.

In an era of declining railway freight revenue,<sup>1</sup> greater competition from trucking and growing pressure on federal budgets, the government must reflect seriously on the extent to which it will remain involved in the railway industry, inevitably leading it to consider the possibility of privatizing part or all of CN. At the same time, more applications for abandonments of line segments underline the obvious — that Canada's large railway infrastructure has significant excess capacity and that rail line rationalization is both economically desirable and perhaps inevitable. This concerns the Committee, because a proliferation of new short line railways, the potential product of main line abandonments, raises safety issues.

Even the National Transportation Act Review Commission, in assessing the impacts of the 1987 Act on competition in the transportation sector, noted the challenges of the future for Canada's railways:

... The current situation is not sustainable ... Even an optimistic observer would acknowledge that Canada's railways cannot make a contribution to increasing national economic competitiveness unless major changes are made to their structures and costs.<sup>2</sup>

As discussions progress on potential rail rationalization and the possible privatization of publicly owned railways, there will be new challenges for both railways and the regulators of railway safety. Any potential consolidation of the CN and CP networks would reduce the actual volume of track used by the Class I companies, call for new service-oriented technologies, and restructure rail infrastructure, operations and administration.

*More applications for abandonments of line segments underline the obvious — that Canada's large railway infrastructure has significant excess capacity and that rail line rationalization is both economically desirable and perhaps inevitable. This concerns the Committee, because a proliferation of new short line railways, the potential product of main line abandonments, raises safety issues.*

Safety issues will become more complex in a restructured industry. The railways, with a self-interest in ensuring safe operations, know the potentially devastating effects of a serious derailment or collision. As the industry evolves, consideration must be given to changing operational practices along railway lines,

trespassing limitations, the need for improved communications and, most importantly, the management of change.

Some form of plant rationalization may be required to improve the overall competitiveness of the Canadian railway industry. During any period of transition, there will be uncertainty as the required adjustments are made. Management changes and labour negotiations in an evolving industry can create a less secure safety environment until a new equilibrium is achieved.

Canada's railway operations are governed by the Canadian Rail Operating Rules, which cover most aspects of safe train operations on federally regulated railways. In the current system, whoever owns the fixed plant — namely, the track — sets the rules. The Committee urges that caution be exercised whenever railway companies restructure their operations and some of the rules change. Dispatching staff and train crews, for example, would require different training to deal with changing configurations. There would be even more obvious concern where sections of main lines disappear and new short lines emerge. Such situations would be further complicated by the uncertainties of a shift in jurisdiction. This underscores the Committee's earlier conclusion about the necessity for harmonizing railway regulation among the provinces.

Canada, unlike the United States, has standardized safety rules which apply consistently to all federally regulated railways. As the face

of the Canadian railway industry changes, it will be important to ensure the continuance of standardized safety rules to give Canada a competitive edge in north-south trade. While there is some discussion in the United States about legislating a national code of operating rules, nothing has yet been resolved. In fact, several large railroads, such as the Norfolk Southern, CSXT and the Illinois Central, maintain their own codes.

If changes come, the Committee cautions the industry to resolve all the differences that arise as structural changes proceed, in order to ensure the continuing safety of operations.

Reduced track could mean more congestion. As lines move into the provincial domain, greater traffic volume on a smaller network could raise safety concerns. Like an automobile driver caught in traffic, the train engineer striving for on-time performance could push the speed limit and thus compromise safety. This has become an issue in the United States, where congestion is widespread and many larger railways face bottlenecks at key terminals and on essential routes. The Committee believes that Canada should monitor the situation and develop an action plan in the event that congestion problems arise here. In 1991, 60% (7,397,724 tonnes) of all rail freight tonnage that Canada received from the United States fed into Ontario and Quebec. Rationalization of rail lines would likely have the greatest impact in those regions.

The Railway Safety Directorate (RSD) seems confident that it can manage any contingencies arising from increased frequencies over one main line.<sup>3</sup> Representatives from VIA Rail have suggested that a frequency increase in traffic over consolidated lines would have more impact on performance than on safety. VIA's concern is that an increased density in freight traffic would impede the ability of the passenger service to operate according to its advertised timetable. This supports the case for separation of passenger and freight traffic where passenger trains could travel on any main line abandoned through consolidation.

In terms of passenger-kilometres, there are approximately eight times the number of fatalities on roads as on railways. The issue is that railways may be perceived by some as unsafe, when in fact they are much safer than road travel. One challenge for railway operators is to protect life, limb and property while minimizing the instances in which, because of safety requirements, trip time is jeopardized.



CN and CP devote resources to safety enhancement on any lines involving mixed operations and multi-carrier use. CN's Montreal Operations Management Centre (OMC) helps rail planners foresee and prevent safety problems over a 30,000 km network of track. The OMC brings together elements of the CN system that affect train movement and improve safety and on-time performance by better managing locomotive movements. This is not a system to control railway traffic, but rather a strategic management planning centre.

In combined railway operations, the OMC could be used if companies other than CN were linked by radio transponders in their locomotives.

In any case, the Committee believes that, for any significant restructuring of the railway industry, standardization of operating procedures, timetables and maintenance-of-way guidelines across all railway operations should be a prime concern in the interests of safety. Moreover, as such restructuring occurs, training must be made available to ensure that all employees are totally at ease within the changed work environment.

Derailments have always been a major safety concern. If and when major plant rationalization occurs, the Committee is concerned about the greater likelihood of derailments on a consolidated main line with heavier traffic flows. Main track derailments have been related to failure to detect internal defects, but the major cause relates to track problems, such as track buckling, broken rails and imperfect track geometry. Equipment-related problems have been the second major source of derailments. Operations problems (e.g., inadvertently reversed switches, operating rule violations or train handling problems) have been the least prevalent cause.

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## RECOMMENDATION 10.1

**We recommend that previous recommendations by the Transportation Safety Board of Canada concerning main track derailments be revisited by both government and industry professionals with a view to raising standards for early detection of rail fatigue, mechanical equipment failure or divergent operating practices.**

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Because the freeing-up of a main line could create the possibility of increased passenger traffic running on an abandoned line, the Committee believes that an attempt should be made to exploit that possibility in order to reduce congestion and increase passenger safety.

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## RECOMMENDATION 10.2

**We recommend that, where any rationalization of the rail infrastructure leaves open the possibility for abandonment of a main line, consideration be given, if financially feasible, to making sections of that main line available for the exclusive use of passenger traffic, in order to reduce congestion and increase safety.**

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## ADVANCED RAILWAY TECHNOLOGIES

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The Committee believes it important to understand emerging technologies and their effects on safety in the railway business. We must ensure in relevant legislation that the *RS Act* of the future is equipped to deal with a restructured railway industry and its new technologies. This section summarizes what the Committee learned about various new railway technologies.

### Equipment Maintenance Techniques

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Current Canadian regulations impose more inspection requirements for equipment than do those of self-regulating railways in Europe. This applies especially to equipment that is subject to preventive maintenance techniques, principally locomotives and passenger cars.

However, there are significant differences between freight and passenger operations. North American regulations are primarily directed at the freight car, with the objective of providing a common safety standard to enable cars to be acceptable for transit from southern Mexico to Hudson Bay. Some of the regulations developed for freight operations may be inappropriate for passenger equipment. The following table highlights some of the differences.

**Table 10.1**  
**COMPARISON OF NORTH AMERICAN FREIGHT**  
**AND PASSENGER OPERATIONS**

<b>Freight cars</b>	<b>Passenger equipment</b>
On-failure maintenance (except some dedicated fleets)	Preventive maintenance system
Individual vehicle documentation only for some fleets of cars	Maintenance system documented by individual vehicle
No on-line maintenance information	On-line maintenance data, with alerts for overdue maintenance and deferred items
Significant damage possible during loading	Safety of car not threatened by passenger wear and tear
Cars subject to damage from hump shunting	Only flat shunting performed
Train consists formed from individual cars	Large element of in-consist operation
No on-vehicle monitoring systems	Monitoring systems for door operation, wheel slip/slide, hot bearings
May be included in a train carrying dangerous goods	No dangerous goods carried
Safety inspections done in yards from trackside	Safety inspections done over a pit in a heated and lighted facility

*Source:* Cole, Sherman and Associates Limited, "Advanced Railway Technologies," Report prepared for the Railway Safety Act Review Committee, August 1994, p. 6.

Passenger operations on the largely self-regulated railways in Europe undergo less inspection than their North American counterparts. For example, British Rail (BR) runs 125 mph equipment for 3 days or 3,000 miles between basic safety inspections and does the equivalent of the #1 brake test only at 32-day intervals. This contrasts with the trip and daily inspection and the #1 brake test each trip in Canada. BR also operates suburban equipment at speeds of up to 100 mph with basic safety inspections at 14-day intervals, when the intervening mileage is typically in the 3,500–4,000 mile range.

Regulations affecting equipment maintenance include:

- basic inspection frequency;
- air brake test frequency;
- air brake component changeout frequency;
- examination of fire extinguishers;
- wheels, axles and drawgear inspection.

The progressive approach in the United Kingdom has been possible because:

- passenger equipment is subject to rigorous preventive maintenance, and the inspections associated with this maintenance are done over a pit in a heated and lighted facility;
- the facility is certified to a recognized quality standard, equivalent to the International Organization for Standardization (ISO) 9000 series;
- there has been a relentless search for cost-efficiency in passenger operations; and
- the U.K. Railway Inspectorate does not regulate equipment maintenance standards.

Canadian passenger equipment, freight locomotives and some freight cars are also subject to preventive maintenance schemes. All VIA and GO Transit equipment is inspected over a pit inside heated and lighted facilities, and VIA facilities are certified to ISO 9000 standards.<sup>4</sup> CN and CP freight locomotives are also maintained in heated and lighted facilities and, in principal locations, the day-to-day servicing is carried out in similar facilities. However, the regulatory process, being prescriptive, has not changed to allow the operator to benefit from the increased quality of its operations.

The Committee found differences in work requirements between Canadian and British rail companies, namely, in employee hours, maintenance schedules for locomotives and cars and requirements for train operations.

A “quality dividend” could be possible where an operator maintains its equipment using quality-controlled preventive maintenance systems. European experience indicates that this dividend could take the form of reduced requirements for day-to-day inspection of



equipment as monitored quality increases. Regulation prior to the *RS Act* inhibited this, and the passenger rail operators have failed to exploit some provisions of the Act in this regard, particularly Section 20. The institutional structure of the rail industry and passenger system operators may have been an inhibiting factor.

### Automated Wheelset Inspection

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The wheelset is critical to the safety performance of rail equipment, and its failure results in the high probability of a dangerous occurrence, such as a derailment. However, field inspection of wheelsets does not permit the detection of all failures in their very early stages and therefore automation of this inspection process is being pursued.

Hot box detectors (HBDs) at the current spacing of 25 miles (40 km) are effective in identifying friction bearing failures, but not effective for all roller bearing failures. Changing the spacing of HBDs does not improve their effectiveness. Audio bearing defect detection appeared a promising technique, but correlation between bearings identified as problematic and eventual bearing failure is poor.

With respect to wheel defects, current visual inspection techniques are inefficient at early identification of wheel failure. Rail impact is a newly developed technology that is effective in uncovering certain defects. Laser inspection has potential and should be developed further. However, automated techniques for effective detection of fractures in the wheel disc, for use in field inspection, are not yet a practical proposition. An increase in failures due to broken wheels and journal failure in roller bearings is most notable. These are areas in which more research and development are needed.

## Advanced Train Control Systems (ATCS)

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A railway control system must achieve two objectives. The first is to impose an anti-collision logic upon the train operations. In simple terms, this means that, whatever the speed of the train, the line in front of the train is clear of obstructions and any switches are correctly lined and locked for a distance in front of the train at least as great as the train's braking distance from that speed.

The second objective is to control the movement of trains so that they are moved through the system with a minimum of delay and according to the railway's corporate aim of serving its customers. This is usually called "train regulation."

The early promise of a universal, electronically based and affordable signalling system that achieves major safety benefits through supervision of train operations has not yet been realized.

The Association of American Railroads' (AAR) ATCS project originated in the mid-1980s with the objective of achieving control of trains using a radio-based data link to the locomotive rather than a voice link or wayside signals. This technology held the promise of positive train control (PTC) to prevent train crews from exceeding their operating authority, a feature that has been called for by accident investigation authorities in both North America and Europe. Computer-aided dispatching for unsignalled lines has been developed and is in operation.

The report of the Commission of Inquiry into the Hinton train collision, following the tragic accident in Hinton, Alberta, recommended in 1986 that advanced train controls be installed on main lines by 1989 and on branch lines soon afterwards. The Commission also recommended that public hearings be held if advanced train controls were not installed. Neither recommendation has been implemented. CN and CP have stated that this recommendation is unrealistic, as this technology does not currently exist and its development has proven extremely expensive.

Whereas Justice Foisy had optimistic expectations about new ATCS, the major railways were less certain that these new technologies would be available within the Commission's time frame for completion. The technology now appears more attainable.



CP currently has a pilot project to transmit operating orders, and CN plans to have its own project operational by the end of 1994.

These pilot projects are designed to provide reactive train protection. That is, the emergency brake will be applied if an operating authority is exceeded and, in the case of the CN system, if any overspeed is recorded. Reactive train protection does not ensure the braking of the train to stop it before it exceeds its authority, but rather after the authority has been exceeded. Depending on its size and speed, a moving train may be expected to travel up to a mile beyond its authority limits before coming to a stop. Reactive train protection would not have prevented the Hinton disaster, but might have mitigated it by reducing the speed of the freight train by the time it reached the point of collision.

The CN and CP pilot projects differ in two ways. In one project, the displays to the crew in the cab are in text format. In the other, those cab displays will be in computer graphics. The projects also differ in their methods of ensuring that the rear of the train is clear of a fouling point, in that the systems are not compatible. The locomotives and crews operating on one system cannot operate on the other system.

Progress has been slower than planned, and this is attributable to an initial underestimation of the implementation time and costs of ATCS, including PTC system development. As well, comprehensive and consistent specifications still have not been developed to the satisfaction of all the railways. Systems implemented to date, such as the ARES system on the Burlington Northern railway in the United States, are largely proprietary and conform only in part to ATCS specifications.

*The previous style of prescriptive regulation lent itself to homogeneity of approach and end product inspection. If we are to move forward, the type of rule or regulation against which compliance is monitored must be performance based.*

Canadian Pacific Limited  
(Submission to the Committee)

Ed Harper of the AAR said, "As FRA [the Federal Railroad Administration] has concluded, the benefits of positive train control do

not presently justify the nearly \$1 billion cost. However, the industry will continue to ascertain whether PTC can be a viable and feasible technology for the future."<sup>5</sup>

## High-Speed Rail

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High-speed rail raises several public, passenger and operating personnel safety issues, and these may require regulations additional to and different from those applicable to current railway operations.

High-speed rail systems use established rail technology but operate to higher standards and closer tolerances. Standards have been established for their operation in Europe and the United States, and Transport Canada has produced guidelines that are generally in accordance with European standards. Mixed operation of high-speed rail and other rail traffic may require additional safety precautions to be imposed on other rail traffic, and the burden of these requirements may inhibit the development of high-speed rail. It is important that safety standards be defined early so that extra costs are not imposed during construction of the project. A coherent system of standards for track and equipment will need to be developed specifically for very high-speed systems like the TGV in France.

Requiring potential operators to demonstrate the safety of the design, construction and operation of their system would allow for innovation and the adoption of progressive technology. The regulator's adoption of guidelines or regulations regarding high-speed rail could be counterproductive. Transport Canada could assist the process by encouraging innovation and by resisting the temptation to produce guidelines or directives.

## Stresses in Rails

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High stresses in rails can cause either sun kinks in hot weather or pull-aparts in cold weather. Both carry a high risk of derailment. Research is being done on the measurement of stresses in rails in place, and this work would allow more accurate prediction of the probability of weather-related problems, leading to more effective preventive action. This research would allow the more precise detection of high-risk areas for track buckling in summer and pull-aparts in winter. Techniques involving the magnetic imaging of the rail would appear to be the best approach, but a practical system for field use has not yet been developed. More research is needed.

The Committee believes that the future technological developments discussed here, and others that will doubtlessly emerge, will contribute positively to railway safety. The Committee's concerns are twofold:

- that, in an era in which short lines are emerging, new technologies be as widespread as possible, with provision for uniformity of application; and
- that new technology not be hindered by legislative rigidity.

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### RECOMMENDATION 10.3

**We recommend that Transport Canada and the railways collaborate to undertake research on, and develop, new railway safety technologies, including advanced train control systems, and that all participants strive for a uniformity of application.**

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## THE FUTURE *RS Act*

The railway industry is entering a period of change that may rival the vitality of the days when the industry was young. The Committee feels that it has, in this report, made recommendations that, if implemented, will achieve what was intended by the original drafters of the Act, in particular minimizing the regulatory burden and shifting responsibility for safety to the railways.

Let us now turn our attention to the modernization of the *RS Act* and associated regulations. The Committee believes that, without sweeping changes, the culture shift that must take place in railways and in the regulator will be impossible.

While the Committee has been impressed with the innovative rule-making process included in the *RS Act*, it was surprised that, even after Transport Canada's conduct of a regulatory review, there remains a mix of new and old regulations made under the *RS Act*, the *Railway Act*, and by both this regulator and its predecessor. An inordinate amount of time was required before the regulator could provide the Committee with a comprehensive list.

Provincial governments informed the Committee of similar difficulties in obtaining a comprehensive list of railway safety regulations. Much of the regulation is, as might be expected since it predates the *RS Act*, quite prescriptive and not in keeping with the intended philosophy of the Act. One can only conclude that the difficulty in even finding which regulations are in effect is not conducive to safe practices in the industry, particularly at a time when there are new entrants to the industry.

The Committee has also taken note of the requirements of the new technology and is concerned about the limitations that may be placed on the development and implementation of new and better technology by existing, obsolete regulation and other forms of prescriptive regulatory instruments, including guidelines.

It is the Committee's opinion that the future of this industry and its safety must not be compromised by inadequacies in the regulatory structure. As the Committee has previously proposed a new approach to regulation and a new role for the regulator, it will be necessary to clean the slate of old, prescriptive legislation, which is no longer relevant, and to develop new rules and regulations as required and as fit the future need.

Further, care must be taken to ensure that any new rules and regulations, and the *RS Act* itself, do not become obsolete and irrelevant in this dynamic transportation sector.

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## RECOMMENDATION 10.4

**We recommend that the *Railway Safety Act* be amended to provide that all orders, rules or regulations dealing with safety matters and issued by the previous authorities be deemed to have been revoked as of January 1, 1997, but only in respect of the safety matters addressed by those instruments.**

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## RECOMMENDATION 10.5

We recommend that Transport Canada maintain and make available a comprehensive, up-to-date volume of all orders and instruments provided for in the *Railway Safety Act* that are not otherwise published in the *Canada Gazette*.

## RECOMMENDATION 10.6

We recommend that any new regulations or rules introduced under the *Railway Safety Act* have a “sunset clause,” to ensure that these instruments remain relevant.

## RECOMMENDATION 10.7

We recommend that the *Railway Safety Act* require a further comprehensive review of its operations five years after any amendments resulting from this Committee’s report.

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## NOTES

1. According to the Western Transportation Advisory Council, rates of return for the major railways have declined over the period 1983–1992. *WESTAC Newsletter*, Vol. 20, No. 1 (September 1994), p. 8.
2. National Transportation Act Review Commission, *Competition in Transportation: Policy and Legislation in Review*, Vol. I (Ottawa: Minister of Supply and Services Canada, 1993), p. 88.
3. Envirotrans, “Safety Implications Concerning the Potential CN–CP Merger of Infrastructure in Eastern Canada,” Report prepared for the Railway Safety Act Review Committee, August 1994, p. 30.
4. *ISO 9000 International Standards for Quality Management* (4th edition), International Organization for Standardization, Geneva.
5. Quoted in G. Welty, “Positive Train Control: Is PTC Worth \$859 Million?” *Railway Age* (August 1994), p. 45.

## A MODEL FOR REFORM

*A responsible regulatory environment will allow railways the freedom to manage their operations.*



### INTRODUCTION

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Throughout this report, the Committee has made numerous recommendations that it feels will serve to promote the highest level of railway safety in the most effective and efficient means possible. In this chapter, these recommendations are examined collectively and a rationale developed for a new and comprehensive framework for the regulation of railway safety in Canada.

The analysis of the aspects of rail safety presented in Chapter 2 shows that Canadians enjoy a railway system with an enviable safety record that has remained reasonably constant since the *Railway Safety Act* (RS Act) came into effect. The Committee believes that the railway industry has shown itself to be capable of providing safe transportation for both people and goods, and in fact has taken the initiative in a number of instances in adding safety improvements that go beyond the requirements of the RS Act. The issue of grade crossings, on the other hand, is still a major concern and will require innovative solutions.

The Railway Safety Directorate (RSD) and the railway industry have had over five years to get used to the RS Act. In most areas, they have not yet used the provisions of the RS Act as was intended — to advance safety efficiently and clearly define their respective safety roles. Progress under the RS Act towards a more railway-driven, flexible system has been slow. The reason for this, the Committee maintains, is rooted in a century-old culture in which both parties adhered to a system replete with prescriptive and detailed regulations imposed by the regulator. Elements of this culture still remain as impediments to a more modern approach to railway safety.

The Committee wishes to propose the establishment of a new approach to rail safety, within which the railways themselves will play the lead role in defining how they will achieve safe railway operations, with the government stressing its responsibility and accountability for



public safety issues, such as crossings. This new approach will require changes to the *RS Act*, as well as changes in approach by both the regulator and the railways. The Committee is confident that this approach will ensure the vitality of the *RS Act* well into the future.

## INITIAL STEPS

### Removing the Canadian Transport Commission's Historical Legacy

Setting the stage for the transition to a framework in which the railways will be given the flexibility to guarantee safety will require dramatic

changes in the current means of operation under the *RS Act*. As noted in Chapter 5, the current regime is still dominated by government-issued prescriptive regulations and orders put forth under the *Railway Act*. Little headway has been made under the *RS Act* in replacing these outdated regulations with more modern and flexible instruments, such as performance-based rules. In effect, both the railways and the regulator are heavily burdened by the Canadian Transport Commission's (CTC) regulatory legacy, which has prevented any true movement towards the realization of Parliament's original intentions. A basic foundation of the Committee's strategy is the removal

*The Committee wishes to propose the establishment of a new approach to rail safety, within which the railways themselves will play the lead role in defining how they will achieve safe railway operations, with the government stressing its responsibility and accountability for public safety issues, such as crossings. This new approach will require changes to the RS Act, as well as changes in approach by both the regulator and the railways. The Committee is confident that this approach will ensure the vitality of the RS Act well into the future.*

of this impediment by placing a time limit on the continuing existence of this body of regulations.

### Expanding the Rule-Making Process of the Act

It was noted in preceding chapters that, generally speaking, regulations as instruments are time-consuming and relatively impervious to change. This was recognized by the framers of the *RS Act* and, to this end, a more adaptable process was meant to be put in place under the *RS Act* — the use of rules. Elsewhere, the Committee has made recommendations that greatly expand the scope of the rule-making process under

Section 19. However, the rules process currently remains a vehicle intended solely for the railways' use.

Earlier on, the Committee expressed its belief that the *RS Act* could be enhanced if the benefits of the rule-making process were extended to public safety matters in which the government could readily be expected to participate. To this end, it is recommended that the rule-making regime be extended to include safety matters now referred to in Sections 7 and 18(2), and that the rules process be available to the regulator. Rules, although at a lower formal level than regulations, still have statutory authority for enforcement purposes and are subject to formal consultation with interested parties. In other words, the rule-making regime — to be utilized by government and the railways — should be the primary tool to enact all provisions directly dealing with railway safety. The regulator, however, should concentrate its rule-making activities on public safety areas, leaving operational issues to the railways. Additionally, as recommended, any regulator-sponsored rules should be subject to cost-benefit analysis, as well as to a "sunset clause."

These elements allow the new approach to cover both railway operations and public safety matters — the existing prescriptive regulatory regime is to be replaced with an expansion of the rule-making process, and new roles for railways and regulator.

## RAIL OPERATIONS

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In safety areas that the railways wholly control — such as operations, engineering and maintenance — the present regime of government inspection appears to contribute little to the overall safety of railway operations. In Chapters 4 and 5, the Committee recommended a new approach that redefines the role of the government in railway operations and strengthens the railways' ability to enhance safety. This approach has several components.

### Setting Performance Standards

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A more efficient approach is one in which safety is enhanced by the initial establishment of set objectives that all parties can strive to attain. Broad performance standards should be established as rules to serve as the objectives for railway safety programs. In the Committee's model, railways propose such standards, consulting with government and other relevant

parties and being subject to governmental approval. The regulator's task in this instance is to provide feedback to allow the realistic setting of targets. This ongoing relationship will allow for the update of both performance standards and safety programs.

## The Safety Program

The approach is based on the principle that the railways retain the independence and flexibility to meet broad objectives as they see fit. In the Committee's model, each railway is regarded as unique and brings to the table different methods by which safety can be attained. For this reason, it was proposed in Chapter 4 that each railway company be required to submit to the government a "safety program," detailing the means by which the macro-standards are to be met.

Nevertheless, the RSD must maintain a level of expertise on a continuing basis to ensure that both performance standards and safety programs represent a base level of standards that will uphold the safety of the industry. The Railway Association of Canada (RAC), too, should guard the minimum safety requirements from an industry standpoint, particularly for new entrants into the industry.

To give a complete picture, the program should discuss the external regulations, rules and standards to be observed, as well as internal company rules and safety plans — all to be linked to the performance standard. The overall program management system for safety, such as the capital, technological and human resources to be devoted to the various subfields constituting railway operations (engineering, equipment, operations), should be described. Based on the overall government-set objective, the program should have its own internally set performance standards at levels of activity below those of the macro-targets.

The expanded rule-making process provides an appropriate institutional avenue for a "safety program" system. The provisions of the enhanced rule-making process in the *RS Act* can be adapted to a program approach because, as recommended, the process will now be more inclusive. Also, the safety program would be submitted as a rule under Section 20 — a rule that the railways are legally obliged to follow. With its inherent flexibility, the rule-making process can adapt to changes in safety plan requirements as needed, should new concerns or technologies arise.



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The use of the rule-making process will ensure that the program remains open to consultation with relevant parties before submission to government. Additionally, the establishment of the consultative committee (Section 44) will provide additional opportunities for consultation.

From the railway perspective, the transition to a program approach should not be overly burdensome. In many instances, existing rules, such as the Canadian Rail Operating Rules (CROR), can be incorporated by reference into a “program” if a railway decides it is appropriate. In this respect, industry associations such as the RAC still have a role to play in bringing the railways together in a national safety framework.

## RSD Monitoring and Auditing

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A program approach will entail a considerable upgrading and change in the range of skills at the RSD from that of a compliance-inspecting regime to that of a monitoring and auditing function. Under this model, the scope of RSD activities regarding railway operations should be limited to the analysis of railway data and practices as submitted in the railways’ safety programs. In this respect, the RSD will have to acquire the expertise to evaluate the processes used by the railways. The Committee envisions the regulator monitoring railway industry safety trends on a continuing basis, auditing the railways in accordance with an agreed multi-year audit plan and performing front-line inspections on a strategic basis to examine areas of concern or validate audit findings.

## Enforcement

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A monitoring and auditing function will likely mean changes in the means by which the RSD ultimately enforces safety. If RSD-developed trends or audits were to identify some deficiency in a process submitted as part of a program, this would be communicated to the railway

concerned, which would be given the opportunity to correct the problem. If the problem represented an immediate threat to safety, an order could be issued. In effect, the means of enforcement will be better focused, but the government will retain the same enforcement powers that it presently has under Sections 31 and 41. However, there will be a new, formal process of appeal in place to adjudicate disagreements on enforcement actions in a timely manner. Additionally, the government will retain emergency directive powers (Section 33) should they be required.

## Provincial/Short Line Participation

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The Committee sees its model as one that the provinces could accept. Provinces would have the opportunity to avail themselves of the new regulatory scheme and to perhaps contract with RSD for their services. Memoranda of Understanding (MOUs) to this effect would have to be made with Transport Canada. This would serve to free interested provinces from the costly burden of establishing regulatory frameworks for a few small railways. The proposed model is inherently flexible in that it gives non-Class I railways the opportunity to submit safety programs uniquely tailored to their circumstances and operating conditions, while at the same time ensuring that a “bottom-line” set of requirements is met to safeguard public safety.

## Conclusions

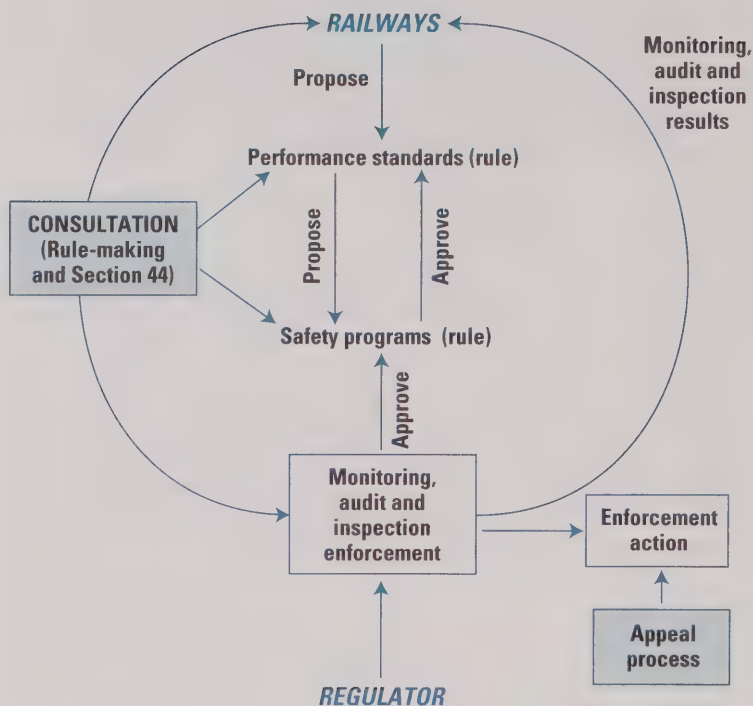
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The approach the Committee has recommended for railway operations is founded on the principle that it be railway-driven, streamlined and flexible. This, in turn, is contingent upon the removal of current prescriptive regulations and the expansion of the rule-making process available to the railways and the regulator to effect change.

Figure 11.1 presents an example of the model. The Committee believes that this more efficient system of regulation for railway operations gives the railways sufficient flexibility to manage their programs, and yet retain appropriate regulatory safeguards, consultations mechanisms and the ability to appeal enforcement actions. This approach will allow both railways and the regulator to direct resources towards areas that need greater attention. The energy and resources currently focused on railway operations in the form of a large-scale government inspection program can now be diverted to more pressing areas, such as grade crossings, thereby increasing the level of rail safety in Canada.



**Figure 11.1**  
**A SAFETY FRAMEWORK**



## CROSSINGS

From Chapter 6, it is clear that grade crossings represent the most complex and problematic area of railway safety. The complexity is inherent given that crossings are the physical intersections of two modes of travel and this inevitably means that responsibility for the total safety of crossings is multi-jurisdictional. In other safety areas, such as railway operations, the ability to react and institute remedial safety measures is easier because it requires the action of only one organization, namely, the railway company. Crossing safety, if it is to be enhanced, necessarily requires the will and action of several parties.

In the course of its deliberations, the Committee has come to see crossing safety as a unique issue, in which both sides of the equation — the rail side and the road side — must be adequately and evenly addressed if advances are to be made.



The Committee's research and consultations led to the conclusion that, in total, the effort to improve crossing safety has not been effective in recent years. This is not the fault of any one party, but is the natural result of a multi-jurisdictional problem that encompasses a myriad of safety variables — funding initiatives for improvements, the effects of whistling, and sightline clearance on adjoining lands, to name only a few.

Indeed, the Committee's basic finding is that crossing safety in all its facets is not the subject of a comprehensive policy thrust by either government or industry. Added to this is the finding that the framework established by the *RS Act* for the role of the RSD and railways in this area is not working as well as intended.

## A New Approach

Because of the issue's complexity, the safety of road–railway intersections must be approached in a systematic manner if it is to be improved. Earlier in this chapter, the need for railways to present to the regulator a systematic program for their operations was addressed. And indeed, in most respects, the railways — in areas that they can control — have developed systematic approaches to the management of safety in which all the variables and factors that go into safe operations are viewed as interdependent.

The same approach should apply to crossings. The Committee feels that it is incumbent upon the regulator to seize the mantle of leadership for crossing safety by combining the numerous factors that enhance crossing safety into a coherent policy thrust that all involved parties can agree upon and implement. RSD actions and the use of the *RS Act* dealing with crossing safety have been inconsistent. A more efficient model will require that the RSD first restructure its decision-making apparatus for funding to link it to set performance objectives for crossing safety improvements. As well, the regulator will have to clearly determine the expected roles of various parties at crossings and assume a leadership role through the pronouncement of clear policies.

**Funding Apparatus** A basic part of the RSD's mandate in regard to crossings is the funding of crossing improvements, and research and education. In each area, the decision-making criteria are overly subjective, and the criteria for the two areas of funding are not linked. In other words, the RSD has no overall plan to decide how the total funds can best be apportioned between the two safety areas.

The regulator must ensure that the best use is made of available resources when addressing road–rail intersection issues. The recommendation in Chapter 6 that the RSD put in place an objective national system of funding priorities for grade crossing improvements is designed to ensure that resources are properly allocated in a safety sense.

*The Committee's research and consultations led to the conclusion that, in total, the effort to improve crossing safety has not been effective in recent years. This is not the fault of any one party, but is the natural result of a multi-jurisdictional problem that encompasses a myriad of safety variables — funding initiatives for improvements, the effects of whistling, and sightline clearance on adjoining lands, to name only a few.*

The funding system must be viewed in the larger context and, to this end, should be geared to national crossing safety objectives, set out as crossing safety performance standards. Every program must have an objective and, with this in mind, it was suggested in an earlier chapter that a comprehensive plan be developed to cut the accident rate at Canadian grade crossings in half within 10 years. This plan should be based upon and developed in tan-

dem with the national system of priorities for crossing improvements. Apart from the basic element of funding initiatives, the plan should encompass the issues of organizational responsibilities at crossings and the impacts of whistling.

***The Roles and Responsibilities of Parties at Crossings*** The regulator will have to outline, in a consistent manner, the obligations of the parties responsible for crossings, including its own. The framework should be based on the fact that crossing safety largely benefits the public. For this reason, the regulator, being responsible for the safety of the public, must play the leading role. For activities on their property, the railways should be fully responsible — and they have been. But if a safety concern exists on adjoining lands, it is unfair to require the railways, in the form of either slowing trains or providing full compensation to landowners, to solely bear the burden of activities undertaken in the public interest. Road authorities, in recognition that driver behaviour is the main cause of crossing accidents, must assume a more appropriate and responsible role.

Clearly delineating and implementing the roles of the various parties will require amendments to, and better usage of, the *RS Act*. The recommendations in Chapter 6 regarding the expansion of the Minister's powers to include ordering the commencement of crossing work or initiating a grant will allow the RSD to assume the leadership role required of government. In addition, as the government employs the rule-making provisions for public safety matters, as recommended in Chapter 6, the roles and responsibilities of the parties concerned with crossings should be better understood.

## Conclusions

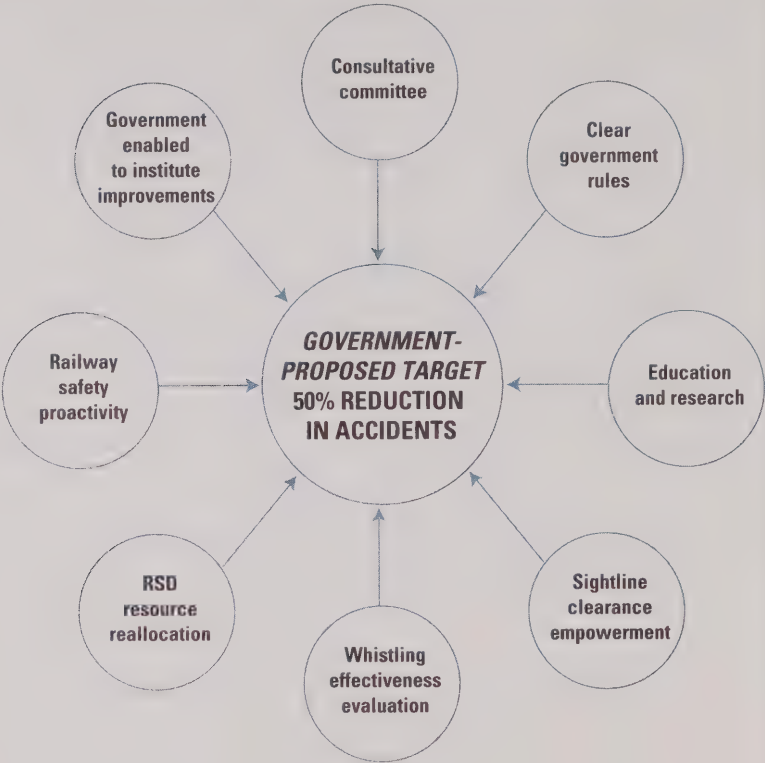
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A summary of contributing factors that together will help to improve crossing safety is depicted in Figure 11.2. It is the Committee's feeling that, to genuinely work towards meeting the target crossing accident reduction of 50%, all aspects of the proposed program must be employed.

The Committee anticipates that, as the suggested regulatory program is put in place, railways will become more proactive on safety issues and the clarity of government public safety rules will ensure that all parties act in concert. Empowerment for sightline clearance should allow for more punctual clearing on a national scale. It is also expected that resources freed up from the existing end-product inspection regime will be used to have a more direct impact on safety, and that research and educational programs on whistling, crossing protection devices and driver behaviour will contribute to improvements in safety. Finally, the establishment of a consultative committee (Section 44) will improve the flow of information and communication between stakeholders and allow specific safety problems to be addressed.

The Committee urges the government to adopt this program in conjunction with the proposed regulatory framework to provide a responsible regulatory environment that will allow railways the freedom to manage their operations, while putting in place the elements required to improve safety.

**Figure 11.2**  
**SAFETY IMPROVEMENT AT GRADE CROSSINGS**



# APPENDIX 1

## OTHER ISSUES



### SECTION 4: DEFINITIONS

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Railway engineering departments are often uncertain as to the difference between the terms “alter” and “maintain” as they pertain to railway works. As well, Section 8 of the *Railway Safety Act (RS Act)*, which allows “maintenance work” to be exempted from the notice filing process, does not define “maintenance.” The Committee considers it appropriate to clarify the meaning of these terms within the *RS Act*.

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#### RECOMMENDATION A.1

**We recommend that the term “alter” in Section 4 of the *Railway Safety Act* be amended to include to reconstruct or change a railway work in form, but not in function, and not to include “maintain.” We further recommend that the term “maintenance” be defined within the *Railway Safety Act* to include any type of work designed to ensure serviceability, but which does not alter the geometry of the structure.**

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Currently, in determining safe railway operations, Section 4(4) stipulates that “regard shall be had not only to the safety of persons and property transported by railways but also to the safety of other persons and other property.” The Committee believes that railway safety has a direct impact on the environment, and that there would be merit in extending the meaning of safety in the *RS Act* to include the preservation of the environment.

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## RECOMMENDATION A.2

**We recommend that Section 4(4) of the *Railway Safety Act* be amended to include the safety of the environment, in addition to the safety of persons and property, in considering the safety of railway operations.**

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### SECTIONS 8–10: NOTICE FOR AND UNDERTAKING OF PROPOSED RAILWAY WORKS

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Committee consultations revealed situations in which the railways have been forced to wait for the prescribed 60-day notice period to expire before being able to commence with a railway work, despite there having been no objections. Combined with seasonal circumstances, this could have the effect of postponing the construction of a safety-enhancing work and adding to its costs. Railways, if conforming to accepted design and construction standards, should not be hampered administratively in their efforts to build safe railway works.

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## RECOMMENDATION A.3

**We recommend that Section 10 of the *Railway Safety Act* be amended to allow for the commencement of a railway work:**

- a) on receipt of notice from all parties to whom the railway must send a notice that they do not object to such a work; or
  - b) where objections have been filed to the proposed work,
    - i) upon approval by the Minister (as is currently the case); or
    - ii) upon withdrawal of all objections.
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## SECTION 12: GRANTS FOR PROPOSED RAILWAY WORKS

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Before a party may file an application for a grant for a grade crossing under Section 12 of the Act, the crossing must have existed for public use for at least three years. The Committee heard from several public and private-sector organizations that this provision restricts the safety-enhancing framework of the grant process. The rationale for inclusion of this provision in the *RS Act* is unclear, although it may have been an attempt by Parliament to ensure that crossing funds are channelled into existing crossings and not used to encourage the building of new crossings. The National Transportation Agency (NTA), which has a cost-apportionment role in this respect, has identified situations in which crossings legally exist as private crossings — due to agreements between the railway company and a third party — but are in fact utilized mostly by the public. Such crossings, even though potentially deserving of grant status, may not be funded under Section 12. Similarly, the province of Alberta and the Federation of Canadian Municipalities noted that urban expansion and changing traffic patterns may lead to a need for improvements at relatively new crossings, even though they may be less than three years old. The Committee has recommended the implementation of a national system of crossing improvement, with objective funding criteria and minimum crossing standards. Proper implementation of such a national system would render the current three-year provision irrelevant. In principle, safety-enhancing funds should be apportioned to the crossings that are the most deserving.

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### RECOMMENDATION A.4

**We recommend that Section 12(1) of the *Railway Safety Act* be amended to remove the requirement for a crossing to have been in existence for public use for at least three years in order to be eligible for a grant application.**

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Currently, the Act disqualifies a railway work from receiving a grant if it was started before the Minister's approval of the grant. In Committee consultations, the railways argued that the current provisions of the Act wrongfully penalize the railways for work that, in many cases, is undertaken because of urgent safety needs. Again, if taken in the context

of the Committee's recommendation that an objective, national system of crossing improvements is required, such restrictive provisions and the elaborate process set up by the Act are, in effect, unnecessary.

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### RECOMMENDATION A.5

**We recommend that Section 12 of the *Railway Safety Act* be amended to allow a grant to also be issued after a crossing work has been commenced.**

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## SECTION 16: RAILWAY WORK COST-APPORTIONMENT

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Currently, parties can apply to the NTAgency for cost-apportionment determinations only respecting a *proposed* railway work. This does not take into account works urgently required in the interest of safety. This may be especially problematic in the future if the Minister, as the Committee has recommended, is empowered to order that a work be begun if a safety threat exists. As well, this section restricts the ability of parties to reach an agreement without referring the matter to the NTAgency.

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### RECOMMENDATION A.6

**We recommend that Section 16 of the *Railway Safety Act* be amended to also allow grade crossing cost-apportionment by the National Transportation Agency after a work has been commenced.**

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The NTAgency informed the Committee that many parties have requested that their crossing cost-apportionment agreements be formalized through the issuance of orders by the Agency. This would not appear to pose a safety problem and would be beneficial in that it would legalize the financial obligations of the respective parties at crossings.

## RECOMMENDATION A.7

**We recommend that Section 16 of the *Railway Safety Act* be amended to allow the National Transportation Agency to formalize crossing cost-apportionment agreements by means of an order of the Agency.**

## SECTIONS 19 AND 20: RULES

One theme of this report is that the railways should be responsible for their own operations. Currently, Transport Canada is in the process of establishing regulations for the purpose of designating safety-sensitive positions in the railway industry. The Committee, however, believes that the uniqueness of each company's internal organization and operations dictates that safety-sensitive positions be defined within each company's safety program. It believes that lines of accountability to the regulator will still be maintained through this approach.

## RECOMMENDATION A.8

**We recommend that the designation of “safety-sensitive” positions be determined by the rail industry and implemented by way of a rule.**

In the event that new information comes to light that alters the original basis on which a Section 19(4) notice is issued, administrative efficiency would be served by allowing the Minister to modify the terms of the original notice. Such an amendment would appear reasonable as long as the rule in question were not changed in a substantive manner and an opportunity were provided to the railway company and any relevant association to review the modifications and communicate concerns to the Minister. Such a process would be more favourable and expedient than the Minister's outright refusal of the rule in the light of new information.

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### RECOMMENDATION A.9

We recommend that Section 19(4)(a) of the *Railway Safety Act* be amended to permit the Minister, in the event that new information comes to light, to subsequently modify the terms and conditions which may have been specified in the notice.

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## SECTION 22: EXEMPTIONS

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It was suggested to the Committee that Section 39 on security measures should be amended to enable the Governor in Council to authorize the Minister to institute security measures, and that a power similar to that outlined in Sections 19–20, whereby a railway may formulate its own rules, should be incorporated into this section. The Committee notes that the Minister is currently empowered to approve or establish security measures. Moreover, the *RS Act* does not prevent the railway companies from establishing their own internal security measures. For the purposes of consistency throughout the *RS Act*, however, scope should exist for a railway to apply for exemption from any security measures established by regulation or imposed by the Minister. For example, circumstances may arise in which industry-wide security measures may not be applicable to each railway company or the industry as a whole. For this reason, inclusion of security-related matters under Section 22 is considered appropriate.

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### RECOMMENDATION A.10

We recommend that the exemption provisions of Section 22 of the *Railway Safety Act* be extended to any security regulation or measure adopted under the provisions of Section 39 of the Act.

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## SECTION 27: RAILWAY SAFETY INSPECTORS

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In order to better reflect the range of activities of individuals appointed under Section 27 of the Act, it was proposed to the Committee that their title be changed from “railway safety inspectors” to “railway safety officers.” In the context of the Committee’s major recommendation that auditing become one of the principal tasks of the Railway Safety Directorate (RSD), the Committee feels that this proposed change in designation is timely.

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### RECOMMENDATION A.11

**We recommend that the *Railway Safety Act* be amended to replace the term “railway safety inspector” with that of “railway safety officer.”**

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## SECTION 28: INSPECTORS’ POWERS

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Currently, Section 28(2) requires that entry into a dispatch office by a railway safety inspector (RSI) be based upon “reasonable grounds” that an offence is being or has been committed. It was suggested to the Committee that Section 28 be strengthened to eliminate any question of an RSI’s right to enter dispatch offices or any other railway facility while auditing safety performance. The Committee agrees with this view, especially in the context that monitoring of dispatching operations has been and will continue to be an essential element of the RSD’s responsibilities. Although no railway has ever refused access to premises, equipment or records, the Committee thought it would be imprudent to base future access needs, for auditing purposes, exclusively on good interpersonal relations between RSIs and railway staff. Data and other forms of documentation are necessary for auditing the safety of railway operations and maintenance. While Section 28 currently allows inspectors to “seize any property,” it is not clear that “property” includes documentation such as track geometry car records. Inspectors would rarely wish to “seize” documents, but would more likely want access to them only for perusal. The Committee considers that an amendment to this section would help clarify both these issues.

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## RECOMMENDATION A.12

**We recommend that Section 28 of the *Railway Safety Act* be amended to permit a railway safety inspector to enter the premises of a railway company for safety audit purposes. Section 28 should be further amended to permit an inspector to require the production of documents or information needed to carry out the audit.**

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## SECTION 31: INSPECTORS' ORDERS

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Currently, an order stays in effect until the immediate threat to safety has been removed to the satisfaction of the inspector issuing the order. If the inspector is unavailable when the time comes to rescind the order, the order remains in effect, creating a problem for the railway subject to it. Consequently, it was proposed to the Committee that Section 31 be amended to allow an order to be rescinded by any qualified inspector when the inspector who issued the order is unable to take the necessary action.

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## RECOMMENDATION A.13

**We recommend that Section 31 of the *Railway Safety Act* be amended to permit a notice or order of one inspector to be altered or removed by another inspector when the inspector who issued the notice or order is unable to act, and that the circumstances of the inspector's inability to act be recorded in the amending document.**

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The Act clearly and properly places the responsibility for the use of safe equipment on the railways. Nonetheless, there may be rare circumstances in which it would be more expedient and efficient for the regulator to directly order the private owner of a rail car to take remedial



safety measures than to require the railway to handle the situation. In this respect, many rail cars carrying dangerous commodities fall into the “privately owned” category. While it is desirable to give the regulator more options for ensuring the safety of equipment used, such a move must be moderated so that the railways still remain the primary managers of safety and are responsible for the safety of their operations, including the use of any privately owned equipment.

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### RECOMMENDATION A.14

**We recommend that Section 31 of the *Railway Safety Act* be amended to permit a notice or order to be issued to a third party owning, leasing or using railway equipment, in addition to the railway concerned.**

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## SECTION 35: MEDICAL INFORMATION

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The requirement for a specified interval between medical examinations for people in safety-sensitive positions is unique — as far as federal transportation legislation is concerned — to the Act. In the air and marine modes of transport, the time period between medical examinations is established by regulation or order and not by the relevant legislation. Currently, Section 35 of the Act has more than sufficient provisions to ensure that employees in safety-sensitive positions are examined for their ability to perform their job safely. An employee is required to advise the physician, prior to a medical examination, if he or she holds a safety-sensitive position. Further, physicians are required to report to the company any medical condition of an employee that is likely to constitute a threat to safety. The Committee believes that the intervals between medical examinations should not be arbitrary, but rather should take into consideration a health-risk assessment based on the physical condition of the employee. For these reasons, the Committee maintains that it is not necessary to rigidly enshrine a yearly interval between medical examinations in the Act itself.

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### RECOMMENDATION A.15

We recommend that Section 35(1) of the *Railway Safety Act* pertaining to medical information be amended to eliminate the 12-month time period between medical examinations and to stipulate that the period between medical examinations be specified in a rule to be filed under Section 19 or 20, or in the railway company's safety plan.

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### SECTION 46: APPLICABILITY OF THE *STATUTORY INSTRUMENTS ACT (SIA)*

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As noted in the body of this report, several regulatory instruments may be issued under the Act, such as regulations, orders, rules and emergency directives. The Committee has made recommendations exhorting that, under a safety program model, rules be made available for public scrutiny. Because rule-making is at the core of the overall process envisioned by the Committee, the public and industry should have ready access to those rules. At the same time, rules must be established swiftly to accommodate changing conditions and technologies. In this respect, to subject rules to the cumbersome scrutiny provisions of the *SIA* would take too long. There would appear to be merit, however, in giving rules public visibility.

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### RECOMMENDATION A.16

We recommend that Section 46 of the *Railway Safety Act* be amended to state that approved rules filed under Section 19 or 20 shall be deemed not to be regulations for the purposes of the *Statutory Instruments Act*, but shall be registered and published in the *Canada Gazette*.

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## SECTION 49: INCONSISTENT PROVISIONS

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Section 49 provides that regulations made under the Act prevail over orders, rules or regulations made under other statutes in the event of inconsistency. Rules filed under Section 19 or 20 are not provided with the same prevailing authority. All organizations consulted on this matter were of the view that the provision of Section 49 should be extended to rules filed under Section 19 or 20.

Rules made under Section 19 or 20 are substitutes for regulations. They are formally approved by the Minister, have the same effect as regulations and are, in all respects, delegated legislation. There appears to be good reason to extend these provisions. This change would be more relevant to rules filed recently under the new law than to older rules or orders issued under previous legislation.

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### RECOMMENDATION A.17

**We recommend that Section 49 of the *Railway Safety Act* be amended to provide that rules made under Section 19 or 20 also prevail to the extent of an inconsistency.**

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## SECTIONS 91 AND 93: REVOCATION OF PORTIONS OF THE *RAILWAY ACT*

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Sections 91 and 93 of the *RS Act*, when proclaimed, will revoke Sections 217, 218 and 221–229 of the *Railway Act*. Those sections deal with the fencing of railway rights of way, the closing of railway gates and fire protection measures. Section 226 of the *Railway Act* empowers the NTA Agency, on receiving a complaint, to inspect a railway for dangerous conditions and to order appropriate repairs, while Section 227 authorizes an Agency inspecting engineer to forbid operations if, in his or her opinion, it is dangerous for trains to operate. Finally, Section 228 requires railway companies to report train accidents to the Agency, which may then inquire into causes pursuant to Section 229.

All matters covered in these sections are clearly subjects that are now dealt with by the *RS Act* or the *Canadian Transportation Accident Investigation and Safety Board Act (CTAISB Act)*. The lack of proclamation of Sections 91 and 93 of the *RS Act*, however, creates clear duplication and conflict of jurisdiction. Technically, these sections are still in force under the *Railway Act*, and the NTAgency would have to receive and act upon a complaint pursuant to Section 226. The Agency advised the Committee that some of these sections have been invoked recently (more specifically, in respect of fencing), leaving the Agency no alternative but to exercise its jurisdiction. The situation, as it now stands, is incompatible with the principle that all safety regulation matters should be transferred to the jurisdiction of the RSD. No compelling reason has been forwarded to the Committee by the RSD as to why these sections have not yet been proclaimed.

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### RECOMMENDATION A.18

**We recommend that Sections 91 and 93 of the *Railway Safety Act* be proclaimed.**

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### THE *SAFE CONTAINERS CONVENTION ACT (SCCA)*

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The *RS Act* grants inspectors the authority to inspect and detain containers found to be unsafe. Currently, a few *RS Act* inspectors are also appointed as *SCCA* inspectors and perform dual functions under both pieces of legislation. Many *RS Act* inspectors, however, are restricted in that the Act does not allow the inspection of containers not situated on railway property. It would be useful to allow RSIs to go beyond railway property to inspect containers. While an amendment to the *RS Act* to extend their authority would address the situation, the Committee believes that the situation could be remedied simply by appointing the same inspectors under both statutes.

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## RECOMMENDATION A.19

**We recommend that all inspectors appointed under the *Railway Safety Act* also be appointed inspectors under the *Safe Containers Convention Act* and that they receive training as required to exercise SCCA functions.**

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### REMOVAL OF CROSS-BUCKS FOLLOWING LINE ABANDONMENT

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During the Committee's consultations, the issue of removing cross-bucks following rail line abandonment was raised several times. This matter is presently the subject of discussion between Transport Canada and the railways in the context of continuing rationalization of rail infrastructure. At present, the railway companies leave the cross-bucks in place until the tracks have been completely removed.

Reluctance to remove cross-bucks can be attributed to the fact that they serve as a warning that tracks still exist. Municipalities often request that cross-bucks be left in place to alert snowploughs and other service vehicles. The main safety concern stems from the fact that non-removal after line abandonment reduces the effect of cross-bucks in general and could contribute to motorist complacency. To ensure that motorists adhere to the warning provided by cross-bucks, the signs should accurately reflect the status of the rail line.

The Committee was advised that dangerous situations could arise when certain vehicles that stop at grade crossings as a matter of policy (i.e., buses) become an obstacle to others that do not stop. Again, this has particularly troublesome implications. Where lines have been abandoned, these situations suggest that safety would be enhanced by the expedient removal of cross-bucks.

The legal responsibility for the removal of cross-bucks lies with the railway companies. They are presently researching the use of alternative signs in places where the tracks remain in situ following a line abandonment.

The Committee believes that the removal of cross-bucks should be a priority and that other signs should be installed until the tracks are taken up. It also believes that the railway companies should accelerate the removal process to ensure that cross-bucks are eliminated once trains cease to operate on a rail line.

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#### **RECOMMENDATION A.20**

**We recommend that the railways remove cross-bucks following abandonment of a rail line that will not be conveyed, and that the road authority be so advised.**

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## APPENDIX 2

### RESEARCH REPORTS



**Administration and Safety Regulations; Rail and Trucking — Environmental and Safety Issues; *Contraventions Act*; General Approach to Safety Regulations; Trespassing Induced by Developments; Seniority Rights at Crossings** *Canarail Consultants Canada Inc.*

**Advanced Railway Technologies** *Cole, Sherman and Associates Limited*

**Authors' and Stakeholders' Expectations and Assessment** *M. Musgrove*

**Environmental Protection Issues** *S. Lavigne, M. Ernst*

**Grade Crossing Issues** *Hickling Corporation*

**Inspections and Compliance Measures of the Rail Safety Program of Transport Canada** *Lykos International Inc., J. Dion, N.R.J. Gwyn, G.R. Heinmiller*

**Inter-Governmental Issues** *E.M. Ludwick & Associates Inc.*

**International Comparisons of Rail Safety Practices**  
*Hickling Corporation*

**Inventory of Rapid Ground Transit Systems and Recreational Railways** *E.M. Ludwick & Associates Inc.*

**Issues in Substance Testing in Canadian and U.S. Railways**  
*Pearmain Partners*

**Minister's Role and Responsibility** *M. Musgrove*

**Profile of Commercial Vehicle Safety in Canada** *Resource Systems Management International Inc.*

**Railway Safety Directorate Funding Actions** *W. Knott*

**Railways' Safety Management** *G.W. English & Associates*

**Railways' Safety Management II** *G.W. English & Associates*

**Recommendations on Safety from Previous Transportation Commissions** *M. Musgrove, S.T. Byerley*

**Roles of the Railway Safety Directorate in Advancing Rail Safety: Rules and Regulations** *Transport Institute, University of Manitoba*

**Safety Implications Concerning the Potential CN-CP Merger of Infrastructure in Eastern Canada** *Envirotrans*

**The Government Regulating Function for Rail Safety**  
*Hickling Corporation*

**The Role of Selected Federal Agencies in Relation to Rail Safety**  
*J. Dion*

**The State of Railway Safety in Canada** *IBI Group*

**Trucking and the Environment** *S. Lavigne*

## LEGAL RESEARCH AND OPINIONS

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**Disclosure of Medical Information: Crown Liability; Substance Use Testing in the Workplace** *Wolch, Pinx, Tapper, Scurfield*

**Issues Relating to the Role and Powers of RSIs and Bearing upon Compliance with and Enforcement of the RS Act** *G.R. Heinmiller, Barrister and Solicitor*

**Review and Appeal Process in Respect of Decisions Made under the RS Act** *G.R. Heinmiller, Barrister and Solicitor*

**Scope and Jurisdiction of the RS Act** *Hume, McLearn, Barristers and Solicitors*

**Standards, Rules and Regulations under the RS Act** *J. Patenaude*

## **APPENDIX 3**

### **FORMAL CONSULTATIONS UNDERTAKEN BY THE COMMITTEE**



#### **Halifax, Nova Scotia, June 7–8, 1994**

Nova Scotia Safety Council  
Halifax Port Corporation  
Due Diligence Management Inc.  
Mr. Roy French  
Cape Breton & Central Nova Scotia Railway

#### **Moncton, New Brunswick, June 10, 1994**

Government of Nova Scotia,  
Department of Transportation and Communications  
City of Moncton  
Government of New Brunswick,  
Department of Transportation  
New Brunswick Safety Council  
Transport Canada: Surface, Atlantic Regional Office

#### **Toronto, Ontario, June 21–22, 1994**

Procor Ltd.  
Metro Toronto Residents' Action Committee (M-TRAC)  
CAW-Canada  
Government of Ontario, Ontario Municipal Board  
Canadian Manufacturers' Association  
GO Transit

#### **Vancouver, B.C., August 9–10, 1994**

Southern Railway of British Columbia  
B.C. Rail  
City of New Westminster  
Government of British Columbia,  
Ministry of Municipal Affairs  
Government of British Columbia,  
Ministry of Transportation and Highways  
Fraser River Harbour Commission  
Vancouver Port Corporation

**Calgary, Alberta, August 12, 1994**

City of Calgary

Mr. Ron McCullough

Government of Alberta, Department of Transportation and Utilities

Central Western Railway Corporation

**Winnipeg, Manitoba, August 16–17, 1994**

City of Winnipeg

Ducks Unlimited

Rail Canada Traffic Controllers

Burlington Northern (Man.) Ltd.

Government of Saskatchewan,

Department of Highways and Transportation

Government of Manitoba,

Ministry of Highways and Transportation

**Montreal, Quebec, September 12–16, 1994**

Railway Association of Canada

Canadian National Railway

Bombardier Inc.

Canadian Pacific Rail System

Mrs. Germaine Morf

VIA Rail Canada Inc.

Canadian Pulp and Paper Association

**London, Ontario, September 22–24, 1994**

Village of Komoka

Township of Lobo

Federation of Canadian Municipalities

Goderich-Exeter Railway Co. Ltd.

City of London

Essex Terminal Railway

**Ottawa, Ontario, October 12–14, 1994**

United Transportation Union

Transport 2000

Brotherhood of Maintenance of Way Employees

Canadian Labour Congress

National Transportation Agency

Transport Canada

**APPENDIX 4**  
**WRITTEN SUBMISSIONS**



Algoma Central Railway	Environment Canada
Bombardier Inc.	Federation of Canadian
Brotherhood of Locomotive	Municipalities
Engineers	French, Roy
Brotherhood of Maintenance	Fry, William
of Way Employees	
CAW-Canada	Geltman, Harold
Canadian Labour Congress	Gouvernement du Québec,
Canadian Manufacturers'	Ministère des Transports
Association	Government of Alberta,
Canadian National Railway	Department of Transportation
Canadian Pacific Rail System	and Utilities
Canadian Pulp and Paper	Government of British
Association	Columbia, Ministry of
Central Western Railway	Transportation and Highways
Corporation	Government of Manitoba,
Cikalik, Claire	Ministry of Highways and
City of Calgary	Transportation
City of Edmonton	Government of Nova Scotia,
City of London	Department of
City of New Westminster	Transportation and
City of Toronto	Communications
City of Vancouver	Government of Ontario,
City of Winnipeg	Ministry of Transportation
Ducks Unlimited Canada	
Due Diligence Management	Halifax Port Corporation
Inc.	Landsborough, David and
	Loretta

McCullough, Ron  
Metro Toronto Residents' Action  
Committee (M-TRAC)  
Morf, Heinrich

National Transportation  
Agency  
Nova Scotia Safety Council

Plesuk, Greg L.  
Procor Ltd.

Railex Inc.  
Railway Association of Canada

Township of Lobo

Union of Canadian Transport  
Employees  
United Transportation Union

VIA Rail Canada Inc.  
Village of Komoka

Walters, H.J.



# APPENDIX 5

## RECOMMENDATIONS



### Chapter 4: The Legislative Framework

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#### RECOMMENDATION 4.1

We recommend that the *Railway Act* be amended so as to eliminate duplicate safety provisions.

#### RECOMMENDATION 4.2

We recommend that coordination agreements as contemplated in Section 6 of the *Railway Safety Act* be implemented between the National Transportation Agency and the regulator to ensure all safety issues are addressed.

#### RECOMMENDATION 4.3

We recommend that Section 35(3) of the *National Transportation Act, 1987* be revoked.

#### RECOMMENDATION 4.4

We recommend that Sections 150 and 152 of the *National Transportation Act, 1987* be amended to remove all references to engineering matters and jurisdiction over safety matters.

#### RECOMMENDATION 4.5

We recommend that Section 36 of the *Railway Safety Act* be revoked.

**RECOMMENDATION 4.6**

We recommend that the *Railway Safety Act* be amended to provide for a statutory framework that sees the railways propose performance standards and a comprehensive safety plan to implement the standards, both of which must be approved by the regulator. We further recommend that approved performance standards and safety plans be made binding on railway companies.

**RECOMMENDATION 4.7**

We recommend that Section 19 of the *Railway Safety Act* be amended to allow the regulator to establish rules on matters of public safety.

**RECOMMENDATION 4.8**

We recommend that the *Railway Safety Act* be amended to provide for authority for the railways to formulate rules under Section 20 of the *Railway Safety Act* in respect of those matters set out in Sections 7 and 18(2).

**RECOMMENDATION 4.9**

We recommend that any existing guidelines concerning matters of public safety be put forward as regulator-sponsored rules.

**RECOMMENDATION 4.10**

We further recommend that any rules sponsored or required to be filed by the regulator be subject to cost-benefit analysis.

### RECOMMENDATION 4.11

We recommend that the *Railway Safety Act* be amended to provide that Section 31(9) be revoked and that appeals of notices and orders issued under Section 31 be directed to a qualified, publicized body, independent of the regulator. We further recommend that there be a provision to permit a timely review and resolution of any appeals, with decisions from this body to be final, it being understood that orders are to remain in force until the appeal has been decided.

### RECOMMENDATION 4.12

We recommend that the Minister of Transport implement the Railway Safety Consultative Committee as specified in Section 44 of the *Railway Safety Act*. We further recommend that the Act be amended to eliminate the specified membership and to permit the Minister to appoint members as required, including representation from railways, unions and public interest groups.

### RECOMMENDATION 4.13

We recommend that Sections 19 and 20 of the *Railway Safety Act* be amended to ensure that all parties are subject to the same time constraints for consultation under the rule-making process.

### RECOMMENDATION 4.14

We recommend that Section 22 of the *Railway Safety Act* be amended to require a consultation process with relevant associations, similar to the process established by Sections 19 and 20, and that a time period be prescribed within which the association consulted may make its views known. We further recommend that the Minister be required to make a decision on an application for an exemption within 30 days of receipt, with provision for one extension of no more than 60 days.

### RECOMMENDATION 4.15

We recommend that a statement of policy relevant to railway safety, outlining objectives and roles, be included in the *Railway Safety Act*.

## Chapter 5: The Regulator: Roles and Responsibilities

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### RECOMMENDATION 5.1

We recommend that the requirement in Section 11 of the *Railway Safety Act* that an affidavit be filed with the Minister by a professional engineer be replaced by a requirement for a letter of declaration by the person in charge of the work on behalf of the party undertaking the work.

### RECOMMENDATION 5.2

We recommend that the regulator, in conjunction with railways, provinces and other relevant parties, perform an analysis of data requirements and availability to fulfil its role as a monitoring and auditing agency and to implement means to collect and analyze the required data.

### RECOMMENDATION 5.3

We recommend that the regulator implement a nationally coordinated program of monitoring, auditing and inspection to hold railways accountable for their safety plans. We further recommend that the current emphasis on front-line inspection be replaced by monitoring of key safety indicators, adherence to a multi-year comprehensive audit plan and the strategic use of limited front-line inspection.

## RECOMMENDATION 5.4

We recommend that railways and the regulator work together to establish key indicators and the requisite data streams, as well as an optimal approach to conducting comprehensive audits of the railways' safety plans.

## Chapter 6: People, Roads and Railways

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## RECOMMENDATION 6.1

We recommend that Transport Canada place higher priority on prevention/education activities as they relate to grade crossings and that a more appropriate proportion of resources be directed to such programs.

## RECOMMENDATION 6.2

We recommend that Transport Canada establish and publish clear objective criteria to guide applications relating to grade crossing improvements and that an up-to-date comprehensive list of prioritized grade crossing improvement projects be publicly available.

## RECOMMENDATION 6.3

We recommend that the *Railway Safety Act* be amended to give the Minister of Transport power to order work for grade crossing improvements and to authorize grants on his or her own initiative where, in the Minister's opinion, it will enhance safety.

## RECOMMENDATION 6.4

We recommend that regulations be promulgated under Section 24(1)(e) of the *Railway Safety Act* to enable railways to exercise their authority to clear sightlines. We further recommend that the regulator explore the possibility of sharing the authority for entering adjoining lands to clear sightlines with provinces and municipalities.

### RECOMMENDATION 6.5

We recommend that Sections 24(2) and 25(3) of the *Railway Safety Act* be reviewed with a view to achieving a fair resolution of the issue of compensating private landowners, including a determination as to whether and by whom compensation should be paid.

### RECOMMENDATION 6.6

We recommend that Transport Canada work in concert with the railway industry and other relevant authorities to establish safety standards for all types of railway crossings in Canada, and that, following the determination of acceptable standards, a plan be developed to ensure that all railway crossings meet the new standards within a specified time or be closed.

### RECOMMENDATION 6.7

We recommend that Transport Canada undertake and publish a comprehensive evaluation of the impacts and effects of anti-whistling on safety and determine the type of protection required before anti-whistling is implemented at crossings. We further recommend that Transport Canada and the railways not approve any new anti-whistling agreements with municipalities until the review has been completed.

### RECOMMENDATION 6.8

We recommend that Transport Canada develop a comprehensive plan to cut in half the accident rate at Canadian grade crossings within 10 years. The plan should not be limited to rules governing grade crossing improvements and separations, but should include research and education needs.



## RECOMMENDATION 6.9

We recommend that Transport Canada investigate, in cooperation with the appropriate authorities in other levels of government and the railway industry, all financial and technical aspects relating to the use of traffic signals to prevent accidents at rail crossings.

## RECOMMENDATION 6.10

We recommend that Transport Canada undertake a review of Canada's standards for grade crossings on high-speed rail lines in conjunction with an analysis of high-speed rail abroad to ensure that Canadian standards are maintained at the highest practical level.

## RECOMMENDATION 6.11

We recommend that Transport Canada, the railway companies and other responsible parties jointly undertake research to achieve increased safety in driver responses at rail crossings, and that such research include an assessment of the technical feasibility, cost and behavioural implications of new technologies.

## RECOMMENDATION 6.12

We recommend that Transport Canada, other authorities and various affected parties sponsor research to determine the most effective ways of understanding and reducing or eliminating trespassing on railway property. The research should deal with behaviour, enforcement, public education and prevention.

## RECOMMENDATION 6.13

We recommend that authority be given to issue tickets for violations of anti-trespassing rules, under either the as yet unproclaimed federal *Contraventions Act* or the *Railway Safety Act*.

## Chapter 7: Rail Safety and the Environment

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### RECOMMENDATION 7.1

We recommend that a Memorandum of Understanding between Transport Canada, Environment Canada and the National Transportation Agency be developed for the purpose of ensuring environmental protection as it applies to railway operations.

### RECOMMENDATION 7.2

We recommend that all newly acquired rail passenger cars be equipped with toilet systems that have full-retention capability and that, where feasible, existing cars be retrofitted no later than the year 2005.

### RECOMMENDATION 7.3

We recommend that the *National Transportation Act, 1987* be amended to require that any application for a rail abandonment be accompanied by a full assessment of its environmental impact, to include factors such as increased congestion of highways, increased pollutants and risk analysis, and that the results of such an assessment be considered in the approval process.

### RECOMMENDATION 7.4

We recommend that Transport Canada and other government agencies review both the current regulatory arrangements and the sources of funding for transportation infrastructure investments for the purpose of creating greater balance between highway and rail. Any policy proposals should address factors such as safety and environmental protection.

## Chapter 8: Substance Use and Abuse

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### RECOMMENDATION 8.1

We recommend that Section 18(1)(c)(iv) of the *Railway Safety Act* be amended so as to clearly give authority to the railways to implement a substance use testing program for employees in safety-sensitive positions. Such testing programs should be in the context of the overall programs of employee counselling and education.

### RECOMMENDATION 8.2

We recommend that substance use be studied in order to determine the extent of the problem. Any existing programs should be adjusted to reflect the results of the study.

## Chapter 9: Provincially Regulated Railways

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### RECOMMENDATION 9.1

We recommend that provinces without proclaimed legislation and regulation be encouraged to implement their own legislative plan compatible with the federal regime or sign a comprehensive agreement with Transport Canada to perform the inspection, monitoring and auditing of railways within provincial jurisdiction on their behalf.

### RECOMMENDATION 9.2

We recommend that Transport Canada take into account the specific attributes of each class of railway in any agreements with provinces for the inspection of provincial railways.

### RECOMMENDATION 9.3

We recommend a joint federal–provincial effort to clarify the regulatory jurisdiction over industrial spurs.

### RECOMMENDATION 9.4

We recommend that Transport Canada seek agreements with the provinces to establish a national, coordinated regulatory system for railway safety following the implementation of this Committee's regulatory program.

## Chapter 10: Safety in the Future

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### RECOMMENDATION 10.1

We recommend that previous recommendations by the Transportation Safety Board of Canada concerning main track derailments be revisited by both government and industry professionals with a view to raising standards for early detection of rail fatigue, mechanical equipment failure or divergent operating practices.

### RECOMMENDATION 10.2

We recommend that, where any rationalization of the rail infrastructure leaves open the possibility for abandonment of a main line, consideration be given, if financially feasible, to making sections of that main line available for the exclusive use of passenger traffic, in order to reduce congestion and increase safety.

### RECOMMENDATION 10.3

We recommend that Transport Canada and the railways collaborate to undertake research on, and develop, new railway safety technologies, including advanced train control systems, and that all participants strive for a uniformity of application.

## RECOMMENDATION 10.4

We recommend that the *Railway Safety Act* be amended to provide that all orders, rules or regulations dealing with safety matters and issued by the previous authorities be deemed to have been revoked as of January 1, 1997, but only in respect of the safety matters addressed by those instruments.

## RECOMMENDATION 10.5

We recommend that Transport Canada maintain and make available a comprehensive, up-to-date volume of all orders and instruments provided for in the *Railway Safety Act* that are not otherwise published in the *Canada Gazette*.

## RECOMMENDATION 10.6

We recommend that any new regulations or rules introduced under the *Railway Safety Act* have a “sunset clause,” to ensure that these instruments remain relevant.

## RECOMMENDATION 10.7

We recommend that the *Railway Safety Act* require a further comprehensive review of its operations five years after any amendments resulting from this Committee’s report.

### Appendix 1: Other Issues

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## RECOMMENDATION A.1

We recommend that the term “alter” in Section 4 of the *Railway Safety Act* be amended to include to reconstruct or change a railway work in form, but not in function, and not to include “maintain.” We further recommend that the term “maintenance” be defined within the *Railway Safety Act* to include any type of work designed to ensure serviceability, but which does not alter the geometry of the structure.

## RECOMMENDATION A.2

We recommend that Section 4(4) of the *Railway Safety Act* be amended to include the safety of the environment, in addition to the safety of persons and property, in considering the safety of railway operations.

## RECOMMENDATION A.3

We recommend that Section 10 of the *Railway Safety Act* be amended to allow for the commencement of a railway work:

- a) on receipt of notice from all parties to whom the railway must send a notice that they do not object to such a work; or
- b) where objections have been filed to the proposed work,
  - i) upon approval by the Minister (as is currently the case); or
  - ii) upon withdrawal of all objections.

## RECOMMENDATION A.4

We recommend that Section 12(1) of the *Railway Safety Act* be amended to remove the requirement for a crossing to have been in existence for public use for at least three years in order to be eligible for a grant application.

## RECOMMENDATION A.5

We recommend that Section 12 of the *Railway Safety Act* be amended to allow a grant to also be issued after a crossing work has been commenced.

## RECOMMENDATION A.6

We recommend that Section 16 of the *Railway Safety Act* be amended to also allow grade crossing cost-apportionment by the National Transportation Agency after a work has been commenced.



### RECOMMENDATION A.7

We recommend that Section 16 of the *Railway Safety Act* be amended to allow the National Transportation Agency to formalize crossing cost-apportionment agreements by means of an order of the Agency.

### RECOMMENDATION A.8

We recommend that the designation of “safety-sensitive” positions be determined by the rail industry and implemented by way of a rule.

### RECOMMENDATION A.9

We recommend that Section 19(4)(a) of the *Railway Safety Act* be amended to permit the Minister, in the event that new information comes to light, to subsequently modify the terms and conditions which may have been specified in the notice.

### RECOMMENDATION A.10

We recommend that the exemption provisions of Section 22 of the *Railway Safety Act* be extended to any security regulation or measure adopted under the provisions of Section 39 of the Act.

### RECOMMENDATION A.11

We recommend that the *Railway Safety Act* be amended to replace the term “railway safety inspector” with that of “railway safety officer.”

**RECOMMENDATION A.12**

We recommend that Section 28 of the *Railway Safety Act* be amended to permit a railway safety inspector to enter the premises of a railway company for safety audit purposes. Section 28 should be further amended to permit an inspector to require the production of documents or information needed to carry out the audit.

**RECOMMENDATION A.13**

We recommend that Section 31 of the *Railway Safety Act* be amended to permit a notice or order of one inspector to be altered or removed by another inspector when the inspector who issued the notice or order is unable to act, and that the circumstances of the inspector's inability to act be recorded in the amending document.

**RECOMMENDATION A.14**

We recommend that Section 31 of the *Railway Safety Act* be amended to permit a notice or order to be issued to a third party owning, leasing or using railway equipment, in addition to the railway concerned.

**RECOMMENDATION A.15**

We recommend that Section 35(1) of the *Railway Safety Act* pertaining to medical information be amended to eliminate the 12-month time period between medical examinations and to stipulate that the period between medical examinations be specified in a rule to be filed under Section 19 or 20, or in the railway company's safety plan.

### RECOMMENDATION A.16

We recommend that Section 46 of the *Railway Safety Act* be amended to state that approved rules filed under Section 19 or 20 shall be deemed not to be regulations for the purposes of the *Statutory Instruments Act*, but shall be registered and published in the *Canada Gazette*.

### RECOMMENDATION A.17

We recommend that Section 49 of the *Railway Safety Act* be amended to provide that rules made under Section 19 or 20 also prevail to the extent of an inconsistency.

### RECOMMENDATION A.18


We recommend that Sections 91 and 93 of the *Railway Safety Act* be proclaimed.

### RECOMMENDATION A.19

We recommend that all inspectors appointed under the *Railway Safety Act* also be appointed inspectors under the *Safe Containers Convention Act* and that they receive training as required to exercise SCCA functions.

### RECOMMENDATION A.20

We recommend that the railways remove cross-bucks following abandonment of a rail line that will not be conveyed, and that the road authority be so advised.



## GLOSSARY



### **Advanced train control system (ATCS)**

ATCS is a developing technology to allow for the control of train movements by radio transmission directly from dispatch centres to computers located in the locomotives.

### **Cantilevered lights**

These are flashing lights at crossings that are positioned over the roadway by means of an additional perpendicular attachment to the pole rather than mounted directly onto an upright pole beside the road.

### **Class I railway**

For rail companies that fall under the legislative authority of Parliament, the National Transportation Agency (NTA) has accorded Class I status to CN, CP and VIA Rail.

### **Commercial vehicle**

A commercial vehicle is defined under the National Safety Code as any commercial truck over 4,536 kilograms gross vehicle weight or any commercial bus capable of carrying more than 10 people, including the driver.

### **Computer-aided dispatch**

Based upon ATCS, the national railways have installed a system in which dispatchers overseeing unsignalled sections of railway are supported by a computer system to validate and print out their train orders. The computer provides interlocking logic to prevent overlapping authorities from being issued.

### **Consist**

The entirety of cars coupled for a particular freight or passenger movement is known as the train consist.

### **Constant warning time devices**

Employed for crossing protection, these devices are placed ahead of the crossing on the right of way and, taking into account the speed of the train approaching the crossing, electronically remit signals to engage the automatic crossing protection system. They provide for a consistent time frame in which automatic protection devices are lowered before the train crosses the roadway.

### **Ditch lights**

These are configurations of lights, on the front-side of locomotives, designed to allow the locomotive engineer to detect obstructions on the right of way and to increase the visibility of the approaching train.

### **Event recorders**

Locomotive event recorders record information pertaining to train operation, such as speed levels, throttle movement, braking and use of train whistles.

### **Friction bearing/roller bearing**

Part of the wheelset, a bearing is the mechanism that bears the friction of wheel and axle. Most rolling stock used to be equipped with friction (plain) bearings, but these have undergone replacement by roller bearings, which have demonstrated less propensity for overheating and, therefore, decreased risk of failure.

### **General orders**

General orders are regulatory requirements applicable to all railways under federal jurisdiction that were issued prior to the implementation of the *Railway Safety Act (RS Act)* under the Canadian Transport Commission (CTC) or the NTAgency.

### **High-speed rail**

High-speed rail, already operational in parts of Western Europe and Japan, is rail passenger service running at much higher speeds than conventional passenger operations. The federal government and the Ontario and Quebec provincial governments are studying the feasibility of introducing high-speed rail in the Quebec–Windsor corridor.

### **Hot box detectors**

Placed at set intervals along a rail line, hot box detectors are designed to measure the absolute bearing temperature, the temperature difference between the bearings on either end of an axle, and the average temperature on both sides of a car and train. A differential above a certain temperature is an indication of potential bearing failure (overheating) and signals the need for bearing maintenance or replacement.

### **Human factors**

Human factors are those elements that influence the performance of people operating equipment or systems; they include behavioural, medical, operational, task-load, machine interface and work environment factors.

### **Interchange rules**

Established on a North American basis through the auspices of the Association of American Railroads (AAR), the interchange rules guide the exchange and use of equipment, such as cars, between one railway and another to ensure consistency and standardization of certain safety practices throughout the industry.

### **ISO 9000**

The International Organization for Standardization is a worldwide federation of national standards bodies. It has developed the ISO 9000 series of standards for quality management assurance.

### **Maintenance of way**

This is a term used to describe railway efforts to maintain the safety of track, track bed and other areas of safety concern, such as obstructed sightlines, associated with the railway right of way.

### **Motive power units (MPUs)**

This is the term used to describe any railway equipment that has the ability of self-propulsion on the trackage, such as locomotives, but excluding steam engines.

### **Operation Lifesaver**

Initiated in 1981 and funded by Transport Canada and the railway industry, Operation Lifesaver is a national program that seeks to reduce crossing and trespassing accidents primarily through the means of education, enforcement and public awareness. Participants include various governmental and non-governmental organizations.



### **Performance standards**

Performance standards in the context of this report refer to measurable targets for railway safety that the railway industry is required to achieve. Created at a macro-level, their establishment is based on broad accident indices and trends, and, as proposed by the Committee, they are to be approved by government as part of a railway's "safety plan" submitted under the rule-making process of the *RS Act*.

### **Public safety**

In relation to railway safety, the term "public safety" in this report means any safety matter or issue that tangibly and directly affects the public interest. Crossing safety, trespassing, whistling and other railway safety matters that are multi-jurisdictional in scope, for example, would be considered public safety issues.

### **Remote locked gates**

This is a type of crossing protection device in the testing stage, designed specifically for remote locations and potentially private crossings. A remote locked gate is an electronically locked gate that bars the roadway and that can be opened only by a dispatcher after he or she has been contacted by the motorist (by telephone or by virtue of a key in the gate itself). The dispatcher, upon determining that there are no trains in the vicinity of the crossing, electronically opens the gate and then closes it.

### **Reset safety control devices**

In locomotives, reset safety controls exist to ensure continued alertness among the crew. The failure of the crew to undertake any operational change in the locomotive or to depress the reset safety control within a specified time results in the sounding of a siren in the locomotive cab. The continued failure of the crew to undertake some type of operational action results in the reset safety controls forcing the train to a stop.

### **Rigid barriers**

This is a crossing device, still in the testing phase, in which a barrier is attached to a raising and lowering mechanism. When in operation, it will deflect vehicles from the rail line if they are hit.

### **Risk management**

This is a management system designed to reduce the impact of risks. It does so by first measuring exposure to risk on the basis of analysis of the severity of the risk and the probability that the risk will occur, and by then determining goals for and methods of achieving reduction of that risk.

**Rule**

A rule is a set of safety instructions or directions pertaining to subject matters contained in Section 18(1) of the *RS Act* and approved by the Minister under Section 19 or 20 of the Act.

**Safety plan**

As proposed by the Committee, a “safety plan” represents the detailed means by which a railway company would meet set performance standards. The plans would be submitted for the government’s approval under the rule-making process, and would be subject to government auditing and enforcement.

**Short line railway**

This is a railway established to operate lines abandoned or conveyed by the national freight carriers. Most of these railways operate within a single province and consequently fall under provincial jurisdiction.

**Shunting**

Shunting is the process of moving cars from track to track in yards, sidings and spurs for coupling into freight movements.

**Straight plate wheels**

The type of wheel used in the North American rail industry for years, straight plate wheels are gradually being replaced by curved plate wheels, which have demonstrated less propensity for failure from thermal crack propagation.

**Track geometry cars**

Used by the national railways in their track defect inspection regimes, these automated cars ride over the track and make complex calculations of track deviations from the preferred alignment. The data from such automated inspections are utilized by the railways to determine track quality indices and subsequent track maintenance needed.

**Wheel impact detector**

A new type of inspection technology in the testing stage, it proposes to detect, through the use of strain gauges or accelerometers in the track, potential defects in wheels, such as tread defects, and also the damaging impact of wheel defects on the track itself.

## ABBREVIATIONS



<b>AAR</b>	Association of American Railroads
<b>ADM</b>	Assistant Deputy Minister
<b>AEI</b>	Automatic Equipment Identification
<b>ARF</b>	Addiction Research Foundation
<b>ATCS</b>	Advanced train control system(s)
<b>BR</b>	British Rail
<b>CAW</b>	Canadian Auto Workers
<b>CEAA</b>	<i>Canadian Environmental Assessment Act (1995)</i>
<b>CEPA</b>	<i>Canadian Environmental Protection Act</i>
<b>CMA</b>	Canadian Manufacturers' Association
<b>CN</b>	Canadian National Railway Company
<b>CNR Act</b>	<i>Canadian National Railways Act</i>
<b>CONRAIL</b>	Consolidated Rail Corporation (U.S. carrier)
<b>CP</b>	Canadian Pacific Limited
<b>CPR</b>	Canadian Pacific Railway
<b>CROR</b>	Canadian Rail Operating Rules
<b>CSXT</b>	CSX Transportation Inc. (U.S. carrier)
<b>CTAISB</b>	Canadian Transportation Accident Investigation and Safety Board
<b>CTAISB Act</b>	<i>Canadian Transportation Accident Investigation and Safety Board Act</i>
<b>CTC</b>	Canadian Transport Commission
<b>DND</b>	Department of National Defence
<b>EAP</b>	Employee assistance program

<b>EARP</b>	Environmental Assessment Review Process
<b>FEEST</b>	Freight Equipment Environmental Simulation Testing
<b>FLB</b>	Flashing lights and bells
<b>FLBG</b>	Flashing lights, bells and gates
<b>FLSB</b>	Flashing light, signal and bell
<b>FRA</b>	Federal Railroad Administration (U.S.)
<b>GCIP</b>	Grade Crossing Improvement Program
<b>GEXR</b>	Goderich and Exeter Railway
<b>GIC</b>	Governor in Council
<b>HBD</b>	Hot box detector
<b>HMRI</b>	Her Majesty's Railway Inspectorate (U.K.)
<b>HRDC</b>	Human Resources Development Canada
<b>HSRI</b>	High-speed rail initiative (FRA)
<b>ISO</b>	International Organization for Standardization
<b>LRT</b>	Light rapid transit
<b>MOU</b>	Memorandum of Understanding
<b>MPU</b>	Motive power unit
<b>MWE</b>	Maintenance-of-way equipment
<b>NAFTA</b>	North American Free Trade Agreement
<b>NTA, 1987</b>	<i>National Transportation Act, 1987</i>
<b>NTAgency</b>	National Transportation Agency of Canada
<b>NTARC</b>	National Transportation Act Review Commission
<b>OMB</b>	Ontario Municipal Board
<b>OMC</b>	(CN) Operations Management Centre
<b>ONR</b>	Ontario Northland Railway
<b>OSH</b>	Occupational Safety and Health
<b>PTC</b>	Positive train control
<b>RAC</b>	Railway Association of Canada
<b>RAPIDS</b>	Database system used by the TSBC

<b><i>RS Act</i></b>	<i>Railway Safety Act</i>
<b>RSD</b>	Railway Safety Directorate (Transport Canada)
<b>RSI</b>	Railway safety inspector
<b>SCAT</b>	System Cause Analysis Techniques
<b>SCCA</b>	<i>Safe Containers Convention Act</i>
<b>SCOT</b>	Standing Committee on Transport (House of Commons)
<b><i>SIA</i></b>	<i>Statutory Instruments Act</i>
<b>SNCF</b>	Société Nationale des Chemins de Fer Français (France)
<b>TC</b>	Transport Canada
<b><i>TDG Act</i></b>	<i>Transportation of Dangerous Goods Act</i>
<b>TGV</b>	Train à Grande Vitesse (France)
<b>TLV</b>	Track Loading Vehicle
<b>TMC</b>	Track motor car
<b>TRAID</b>	Traffic Accident Information Database (TC Surface)
<b>TRANSCAER</b>	Canadian Chemical Producers Association's Responsible Care Program
<b>TSBC</b>	Transportation Safety Board of Canada (applied name of the CTAISB under Federal Identity Program)

## MEMBERS OF THE COMMITTEE

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<b>Armand Goguen</b> <b>Member</b>	<b>Chairman</b> <b>M.C. Engels</b>	<b>Wayne Onchulenko</b> <b>Member</b>
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## COMMITTEE STAFF

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### OFFICE OF THE EXECUTIVE DIRECTOR

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<b>Executive Director</b> Peter T. Brennae	<b>Executive Assistant</b> Lori Pratt
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### CONSULTATIONS, RESEARCH AND COMMUNICATIONS

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<b>Director General</b> Gordon Chapman	<b>Assistant Director, Consultations</b> Richard Danis
<b>Consultations Analyst</b> Stephanie Jackson	<b>Consultations Assistant</b> Diane Shane
<b>Research Coordinator</b> Nicholas Gwyn	
<b>Research Analysts</b> Michèle Musgrove Sandy Lavigne	<b>Research Assistant</b> Dianne Chrétien

### ADMINISTRATION AND FINANCE

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<b>Finance and Personnel</b> Louise Tailleux	<b>Administrative Services</b> Jennifer Smith
<b>Library</b> Anne Hooper	



## CONSULTANTS AND CONTRACTORS

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Byerley, S.T.	Kelsall, John P.
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Dion, Joseph	Patenaude, Jean D.
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